Vacuum circuit breakers

# Evolis from 7.2 to 24 kV

Catalogue

2005

a brand of Schneider Electric

Merlin Gerin

## The Guiding System, the new way to create your electrical installations

### A comprehensive offer of products with consistent design

The Guiding System is first and foremost a Merlin Gerin product offer covering all electrical distribution needs. However, what makes all the difference is that these products have been designed to operate togheter: mechanical and electrical compatibility, interoperability, modularity, communication.
Thus the electrical installation is both optimised and more efficient: better continuity of supply, enhanced safety for people and equipment, guaranteed upgradeability, effective monitoring and control.

### Tools to simplify design and implementation

With the Guiding System, you have a comprehensive range of tools - the Guiding Tools - that will help you increase your product knowledge and product utilisation. Of course this is in compliance with current standards and procedures.
These tools include technical booklets and guides, design aid software, training courses, etc. and are regularly updated.

The Guiding System, combined
with the know-how and creativity,
allows optimised, reliable, open-ended
and standard compliant installations

### For a genuine partnership with you

Because each electrical installation is unique, there is no standard solution. With the Guiding System, the variety of combinations allows for genuine customisation solutions. You can create and implement electrical installations to meet your creative requirements and design knowledge.
You and Merlin Gerin's Guiding System form a genuine partnership.

**For more details on the Guiding System,
consult www.merlin-gerin.com**

## A consistent design of offers from Medium Voltage to Ultra terminal

*Discrimination guarantees co-ordination between the operating characteristics of serial-connected circuit-breakers. Should a fault occurs downstream, only the circuit-breaker placed immediately upstream from the fault will trip.*

*Prefabricated and tested solutions, upstream and downstream from the device complying with the IEC 60439-1 switchboard standard.*

Transparent Ready

*Thanks to the use of standard Web technologies, you can offer your customers intelligent Merlin Gerin switchboards allowing easy access to information: follow-up of currents, voltages, powers, consumption history, etc.*

## Guiding Tools for more efficient design and implementation of your installations.

**All Merlin Gerin offers are designed according to electrical, mechanical and communication consistency rules.**
**The products express this consistency by their overall design and shared ergonomics.**

### Electrical consistency:

Each product complies with or enhances system performance at co-ordination level: breaking capacity, Isc, temperature rise, etc. for more safety, continuity of supply (discrimination) or economic optimisation (cascading).
The leading edge technologies employed in Merlin Gerin's Guiding System ensure high performance levels in discrimination and cascading of protection devices, electrodynamic withstand of switches and current distributors, heat loss of devices, distribution blocks and enclosures.
Likewise, inter-product ElectroMagnetic Compatibilty (EMC) is guaranteed.

### Mechanical consistency:

Each product adopts dimensional standards simplifying and optimising its use within the system.
It shares the same accessories and auxiliaries and complies with global ergonomic choices (utilisation mode, operating mode, setting and configuration devices, tools, etc.) making its installation and operation within the system a simpler process.

### Communication consistency:

Each product complies with global choices in terms of communication protocols (Modbus, Ethernet, etc.) for simplified integration in the management, supervision and monitoring systems.

## SM6

Medium voltage switchboard system from 1 to 36 kV

## Sepam

Protection relays

## Masterpact

Protection switchgear from 100 to 6300 A

**Trihal**

MV/LV dry cast resin transformer from 160 to 5000 kVA

**Evolis**

MV vacuum switchgear and components from 1 to 24 kV.

## The Technical guide

These technical guides help you comply with installation standards and rules i.e.:
The electrical installation guide, the protection guide, the switchboard implementation guide, the technical booklets and the co-ordination tables all form genuine reference tools for the design of high-performance electrical installations.
For example, the LV protection co-ordination guide - discrimination and cascading - optimises choice of protection and connection devices while also increasing markedly continuity of supply in the installations.

## CAD software and tools

The CAD software and tools enhance productivity and safety.
They help you create your installations by simplifying product choice through easy browsing in the Guiding System offers.
Last but not least, they optimise use of our products while also complying with standards and proper procedures.

## Compact

Protection switchgear system
from 100 to 630 A

## Multi 9

Modular protection switchgear
system up to 125 A

## Prisma Plus

Functional system for electrical
distribution switchboards
up to 3200 A

**Pragma**
Enclosures for
distribution
switchboards
up to 160 A

**Canalis**
Prefabricated Busbar
Trunking
from 25 to 4000 A

**PowerLogic**
Power
management

## Training

Training allows you to acquire the Merlin Gerin expertise (installation design, work with power on, etc.) for increased efficiency and a guarantee of improved customer service.
The training catalogue includes beginner's courses in electrical distribution, knowledge of MV and LV switchgear, operation and maintenance of installations, design of LV installations to give but a few examples.

# Evolis
## Circuit breakers adapted to your needs

*Evolis: a range of circuit breakers that takes account of your electrical installations' requirements today and in the future.*

*Evolis is an integral part of the Merlin Gerin Guiding System.*

## Description

Evolis: a range of vacuum-type circuit breakers from 7.2 kV to 24 kV, combining easy selection and a comprehensive offer:

- a fixed, frontal or lateral version
- a withdrawable, frontal version with a circuit breaker and cradle
- a fixed, lateral version equipped with an integrated protection chain
- separately delivered accessories.

The Evolis circuit breaker is operated via a spring mechanism that gives an operating speed that is independent of the operator and that does not require an auxiliary power supply.
When the operating mechanism is motorized the circuit breaker can include telecontrol functions and carry out rapid reclosing cycles.
The various circuit breaker versions are easy to integrate in a cubicle environment.
An Installation Guide details the required procedure.

## Applications

Evolis is intended for use in medium voltage network applications, in new installations or renovation, for utilities companies, infrastructures, the process industry and the tertiary sector.
It provides protection for all types of applications: cables, overhead lines, motors, capacitors, transformers, source busbar sections, etc.

## Evolis, a fixed, frontal or lateral version

Here the circuit breaker is in its simplest version. In this case it can be combined with additional accessories to meet various requirements.
For the fixed lateral version, the MV connection can be on the right or on the left depending on the type of circuit breaker.

PE40002

*Evolis 17.5 kV fixed, frontal version*

PE55692

*Evolis 24 kV fixed, frontal version*

PE55930

*Evolis 24 kV fixed, lateral version*
*MV connection on the left hand side*

PE55931

*Evolis 24 kV fixed, lateral version*
*MV connection on the right hand side*

# Evolis
Circuit breakers adapted to your needs (cont.)

## Evolis: a withdrawable, frontal version

In this version, the circuit breaker is equipped with arms, clusters and a rack and cradle. The cradle and the circuit breaker can be ordered and delivered separately.

PE55101

*Evolis 17.5 kV withdrawable, frontal version*

PE55693

*Evolis 24 kV withdrawable, frontal version*

## EVOset: a fixed, lateral version equipped with an integrated protection chain

The EVOset is provided with a fully autonomous integrated protection chain (with a VIP type control unit) operating without an auxiliary power source. The protection unit exists in 4 models: VIP30, VIP35, VIP300P and VIP300LL. VIP protection units are associated with functional current sensors. The circuit breaker is delivered with its factory-tested protection chain. It therefore simplifies the panel builder's installation work.

PE55932

*EVOset 24 kV fixed, lateral version*
*MV connection on the right hand side*

*As a specialist in breaking technologies, Merlin Gerin took naturally an interest in vacuum breaking techniques.*
*A major R&D investment was made to develop and engineer Evolis, providing customers with the very best of vacuum technology.*

DE60163

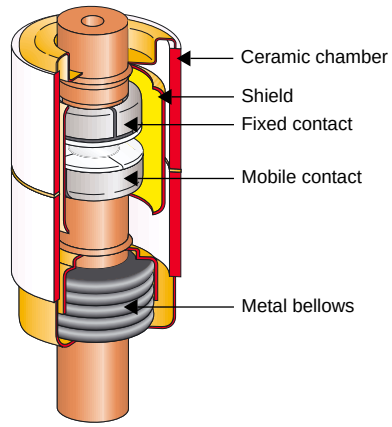


*Fig. 1: vacuum interrupter components*

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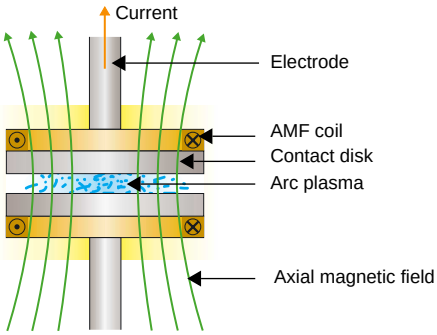


*Fig. 2: cross-section of AMF contact*

PE60042

*Fig. 3: diffuse vacuum arc AMF technology*

## Make-up of a vacuum interrupter

Vacuum interrupters basically have two electrical contacts, one fixed and the other mobile, and a sealed enclosure. The latter enables a high level of vacuum to be maintained inside the interrupter (less than $10^{-2}$ Pa) to provide insulation between the open contacts.

The dielectric strength of the vacuum allows the contact-to-contact distance to be reduced. This short distance together with the low opening speed allow the use of a low energy control mechanism. A metal clusters provides the link between the mobile contact and the enclosure.

In order to keep the vacuum level required for the correct operation of the interrupter for 30 years, the enclosure must be perfectly sealed, and the various components have to be fully degased. This is achieved by:
- choosing materials that are specifically selected for this application (metals and ceramics)
- choosing an appropriate assembly process (vacuum, high temperature brazing)
- the use of a “getter” material to absorb the residual gas.

## Current breaking in a vacuum interrupter

In vacuum breaking, the electrical arc generated on separation of the contacts is made up of a plasma of metal vapors produced by the vaporization of the contact material.

At low values of current, these vapors very quickly condense on the shield and contacts when the arc disappears, thus allowing:
- the vacuum to be re-established
- a contact-to-contact dielectric strength to be restored that is greater than the recovery voltage: breaking is then complete.

At high currents, the electrical arc in the vacuum switches to a concentrated mode which causes high, localized temperature rises on the contacts. The existence of these hot spots is detrimental to the quick restoring of the dielectric strength. Two techniques can be used in order to avoid this stagnation of the static concentrated arc:
- the so called RMF (Radial Magnetic Field) technique, involves rotating the arc thanks to an electromagnetic effect generated by a radial magnetic field; this therefore limits contact erosion.
- a more recent technique called AMF (Axial Magnetic Field) involves applying an axial magnetic field parallel to the axis of the two contacts (fig. 2) which allows a diffuse arc to be maintained (fig. 3) even at high current values. The arc energy is spread over the whole contact surface area, therefore causing very low levels of erosion.
- Merlin Gerin has chosen this last technique for the Evolis range.

*Merlin Gerin's choices for Evolis combined with its industrial expertise provides customer with a highly reliable range of circuit breakers. These products are suitable for the most demanding conditions with the guarantee of full compliance with international standards.*

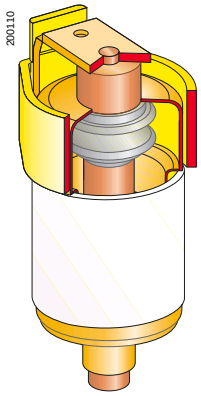


*Fig. 4: 17.5 kV external coil type interrupter*

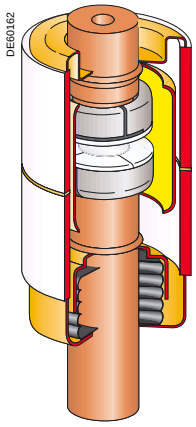


*Fig. 5: 24 kV internal coil type interrupter*

## AMF technology

Evolis circuit breakers use AMF type vacuum interrupters.
According to technical and economic optimization considerations, the axial magnetic field is generated:

- either by a coil outside of the interrupter (fig. 4), for rated voltages up to 17.5 kV
- or by a coil integrated in the interrupter contact structure (fig. 5), for the 24 kV voltage level.

In both cases the AMF vacuum interrupters feature low arc voltages (Uarc of around 50 V) and maximum usage of the contact surface for very low contact erosion.

## The advantages provided

The above choices provide customers with the following advantages in MV circuit breaker applications:

- simple and compact vacuum interrupters
- high electrical endurance meaning that there is no need for contact wear inspection in normal network protection applications including highly disturbed overhead line feeders.

PE55694

*Vacuum interrupter*

PE55695

*Industrial process expertise*

## Systematic advanced control

The main components of the circuit breaker, such as vacuum interrupter and operating mechanism, are produced by Schneider Electric. The vacuum interrupters are manufactured in an ultra-modern production unit in France.
During manufacture, each circuit breaker is subjected to systematic advanced testing.

**Vacuum interrupter testing**
The level of vacuum in each interrupter is tested using the “magnetron discharge method”.
Using this sophisticated procedure, measurement is very precise and does not require access to the inside of the interrupter, thus not affecting the airtight seal.

**Circuit breaker testing**
A rigorous set of tests and measurements is carried out on each circuit breaker. The results are reported and signed off by the quality control department on each device’s test certificate to ensure product traceability.

## Compliance with standards

- Evolis complies with IEC 62271-100.
- Design and production are certified to ISO 9001: 2000.
- Production sites are certified to ISO 14001 (environmental standard).

DE55745

AFAQ ISO 9001 VERSION 2000

DE55746

AFAQ ISO 14001

## Certification

The certificate of conformity provides guarantees that the circuit breaker:
- has been subject to type tests according to EN 45001 standards procedures in accredited laboratories by independent organizations
- is in conformity with recognized international standards.

Evolis is currently being certified by external EN 45011 accredited organizations, members of the STL (Short circuit Testing Liaison):
- EN 45001: general requirements for the competence of testing and calibration laboratories
- EN 45011: general requirements for bodies of operating product certification systems.

## Environmental care

Product design takes account of the environmental constraints described in a “Product Environment Profile” dossier (PEP).

An end-of-service-life manual details procedures for dismantling and processing components.

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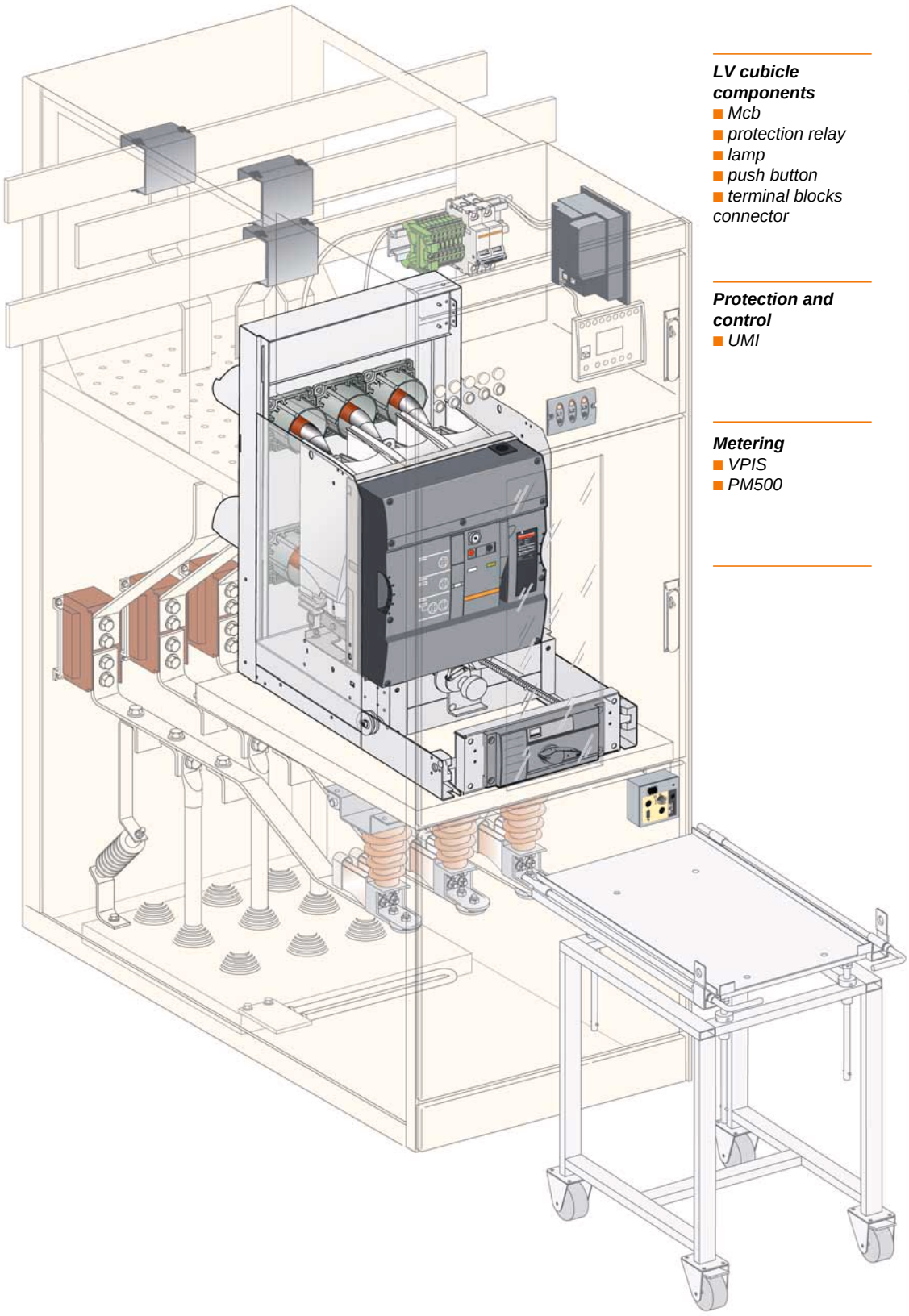
# Extended products offer

PE55691



***Circuit breaker***
- *pilot*
- *cradle*

***Instrument transformer***

***MV cubicle components***
- *capacitor insulator*
- *earthing switch*
- *heating resistor*
- *voltage presence indicator*
- *crank*
- *extraction table*

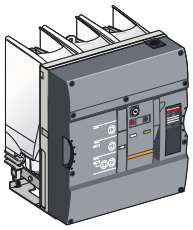
***LV cubicle components***
- *Mcb*
- *protection relay*
- *lamp*
- *push button*
- *terminal blocks connector*

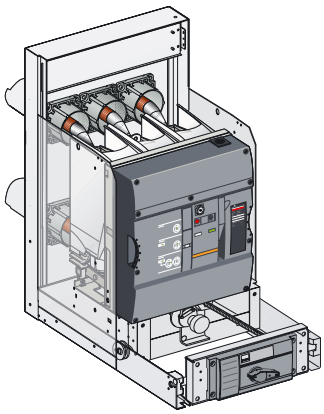
***Protection and control***
- *UMI*

***Metering***
- *VPIS*
- *PM500*

# Circuit breakers

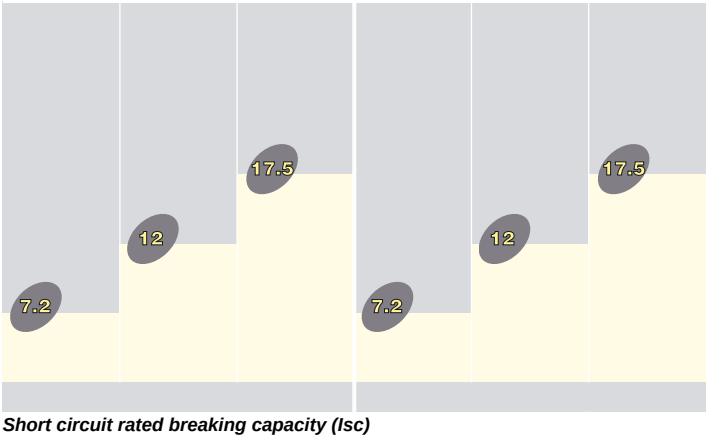
## Evolis from 7.2 kV to 17.5 kV





| Fixed, frontal version<br>Operating mechanism<br>on the front | Withdrawable, frontal version<br>Operating mechanism<br>on the front |
|---|---|
| | |

***Rated voltage Ur (kV, 50/60 Hz)***



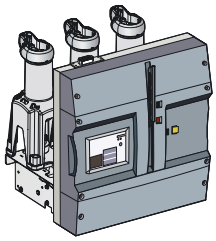

***Short circuit rated breaking capacity (Isc)***

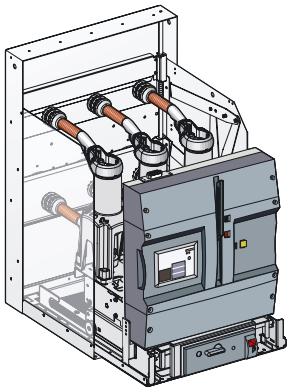
| | |
|---|---|
| from 25 to 40 kA | from 25 to 40 kA |

***Rated current (Ir)***

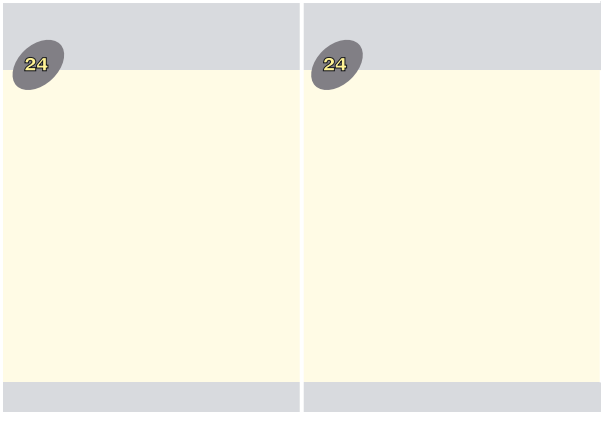
| | |
|---|---|
| from 630 to 2500 A | from 630 to 2500 A |

## Evolis 24 kV



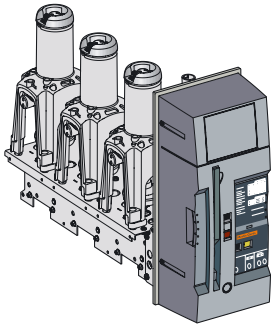
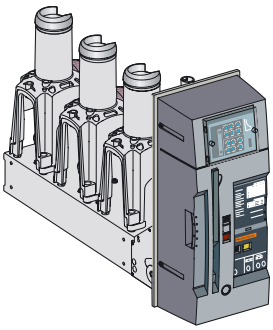
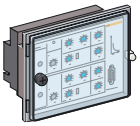
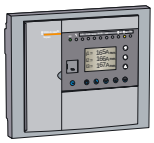


| Fixed, frontal version<br>Operating mechanism<br>on the front | Withdrawable, frontal version<br>Operating mechanism<br>on the front |
|---|---|
| The “Pilot” option monitors correct circuit breaker operation | The “Pilot” option monitors correct circuit breaker operation |
| Transparent Ready<br>WEB enabled | Transparent Ready<br>WEB enabled |




| | |
|---|---|
| from 16 to 31.5 kA | from 16 to 31.5 kA |
| from 630 to 2500 A | from 630 to 2500 A |

## Protection, monitoring and control

| | EVOset 24 kV | Protection | Protection and control | Metering |
|---|---|---|---|---|
|  |  |  |  | |
| **Fixed, lateral version**<br>Operating mechanism on the side<br>The “Pilot” option monitors correct circuit breaker operation<br>Transparent Ready WEB enabled | **Fixed, lateral version**<br>Operating mechanism on the side - Integrated protection system | **VIP30**<br>for phase protection<br>**VIP35**<br>for phase and earthing protection<br>**VIP300P**<br>for phase protection<br>**VIP300LL**<br>for phase and earthing protection | **Sepam series 20**<br>for normal applications<br>**Sepam series 40**<br>for demanding applications<br>**Sepam series 80**<br>for full applications | **PM500, PM700**<br>for basic metering<br>**PM800**<br>for advanced metering<br>**CM3000, CM4000**<br>for full metering and power quality |
| ***Rated voltage Ur (kV, 50/60 Hz)*** | | | | |
| 24 | 24 | | | |
| ***Short circuit rated breaking capacity (Isc)*** | | | | |
| from 12.5 to 25 kA | from 12.5 to 20 kA | | | |
| ***Rated current (Ir)*** | | | | |
| from 630 to 1250 A | from 630 to 1250 A | | | |

*Separate catalogue*

# Evolis 17.5 kV fixed, frontal version

*Panorama* *11*

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# Main characteristics

PE40002

## Electrical characteristics according to IEC 62271-100

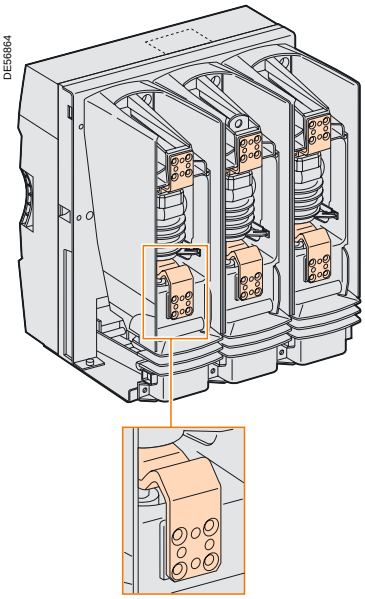
| **Ur 7.2 kV** | **Isc** | **Ir** | | | |
|---|---|---|---|---|---|
| **Phase to phase distance (mm)** | | | **145** | **185** | **240** |
| Ud 20 kV 50 Hz, 1 min | 25 kA | 630 A | ■ | ■ | |
| Up 60 kV peak | | 1250 A | ■ | ■ | |
| | | 2500 A | | | ■ |
| | 31.5 kA | 630 A | | ■ | |
| | | 1250 A | | ■ | |
| | | 2500 A | | | ■ |
| | 40 kA | 630 A | | | ■ |
| | | 1250 A | | | ■ |
| | | 2500 A | | | ■ |
| **Ur 12 kV** | **Isc** | **Ir** | | | |
| **Phase to phase distance (mm)** | | | **145** | **185** | **240** |
| Ud 28 kV 50 Hz, 1 min | 25 kA | 630 A | ■ | ■ | |
| Up 75 kV peak | | 1250 A | ■ | ■ | |
| | | 2500 A | | | ■ |
| | 31.5 kA | 630 A | | ■ | |
| | | 1250 A | | ■ | |
| | | 2500 A | | | ■ |
| | 40 kA | 630 A | | | ■ |
| | | 1250 A | | | ■ |
| | | 2500 A | | | ■ |
| **Ur 17.5 kV** | **Isc** | **Ir** | | | |
| **Phase to phase distance (mm)** | | | **145** | **185** | **240** |
| Ud 38 kV 50 Hz, 1 min | 25 kA | 630 A | | ■ | |
| Up 95 kV peak | | 1250 A | | ■ | |
| | | 2500 A | | | ■ |
| | 31.5 kA | 630 A | | ■ | |
| | | 1250 A | | ■ | |
| | | 2500 A | | | ■ |
| | 40 kA | 630 A | | | ■ |
| | | 1250 A | | | ■ |
| | | 2500 A | | | ■ |

## Additional characteristics according to IEC 62271-100

| **Rated values** | | | |
|---|---|---|---|
| Voltage | **Ur** | kV rms | 7.2-12-17.5 |
| Insulation voltage: | | | |
| - power frequency withstand | **Ud** | kV rms | 20-28-38 |
| - lightning impulse withstand | **Up** | kV peak | 60-75-95 |
| Frequency | **fr** | Hz | 50-60 |
| Short time withstand current | **Ik/tk** | kA | Isc/3 s |
| Peak withstand current | **Ip** | kA peak | 2.5 Isc (50 Hz) |
| | | | 2.6 Isc (60 Hz) |
| Short circuit making capacity | | kA peak | 2.5 Isc (50 Hz) |
| | | | 2.6 Isc (60 Hz) |
| **Other characteristics** | | | |
| Operating sequence | | | O-0.3 s-CO-15 s-CO |
| | | | O-0.3 s-CO-3 min-CO |
| | | | O-3 min-CO-3 min-CO |
| Operating times | Opening | | < 50 ms |
| | Breaking | | < 60 ms |
| | Closing | | < 65 ms |
| Mechanical endurance | Class | | M2 |
| | Number of switching operations | | 10000 |
| Electrical endurance | Class | | E2 |
| Number of switching operations at full Isc value | 25 kA | | 100 |
| | 31.5 kA | | 50 |
| | 40 kA | | 30 |
| Capacitive current breaking capacity | Class | | C1 |
| Operating conditions | | | –25°C to +40°C |
| Average relative humidity | Over 24 h | | < 95% |
| | Over 1 month | | < 90% |

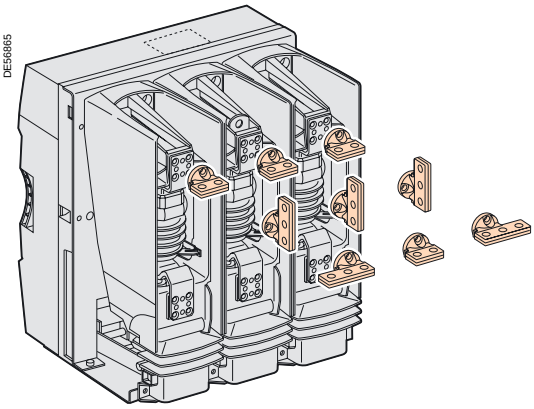
# Description of functions
## MV connection

DE56864



*Connection terminal*

DE56865



*3 connector sets*

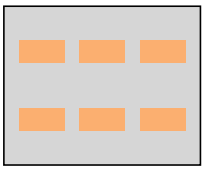
### Composition

The basic circuit breaker is equipped with drilled copper connection terminals, at the top and bottom of the breaking units.
The connectors are fitted to the terminals using the corresponding bolts.
Several variants are possible.

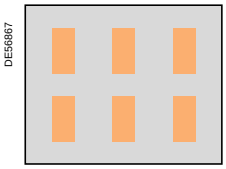
### Fixed connectors

**Horizontal connectors (H)** | **Vertical connectors (V)** | **Mixed connectors**

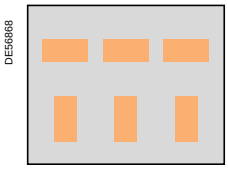
DE56866



DE56867



DE56868

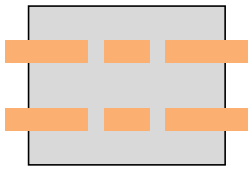


An adjustable connector enables the vertical distance to be increased to enable rotation of 90°.

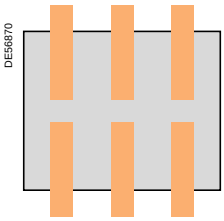
### Adjustable gap connectors

**Extendable connectors horizontal (H)** | **Extendable connectors vertical (V)**

DE56869



DE56870

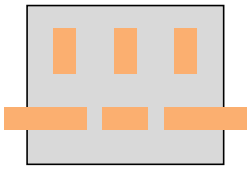


An adjustable connector enables the connection distance to be increased from 0 to 25 mm.

### Mixed solution

**Example**

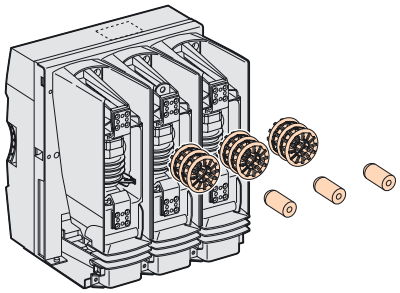
DE56871



***Comment:***
*The insulation withstand values given in the performance table, do not take account of the connectors.*
*With these connectors it is possible to use unplated or tin-plated copper conductors or tin-plated aluminium conductors, without any specific precautions being required.*
*The shape and dimensions of these conductors must be determined by the panel builder according to the dielectric withstand and temperature rise characteristics of the whole connection system.*
*Typical examples are provided in the Installation Guide.*

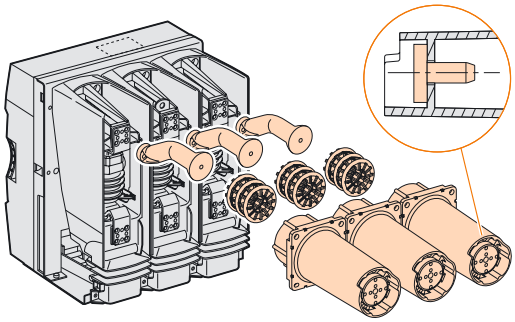
# Description of functions
## MV connection (cont.)

DE56872



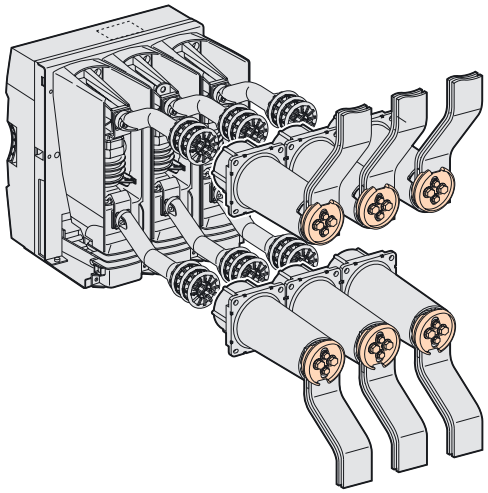
*Clusters and fingers*

DE51945



*Arms and bushings*

DE56874



*Arms, clusters, fingers and bushings, busbars and field deflectors*

### Composition
Panels builders can transform a fixed device into a withdrawable device by adding the following assemblies:
- arms
- clusters
- fingers
- bushings
- field deflectors.

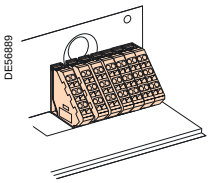
### Cluster and finger
- The tulip type cluster has a shape which provides maximum contact surface whilst optimising heat dissipation. Moreover, in the case of short-circuit, it offers good compensation characteristics for electrodynamic forces.
- The finger is a component designed specifically for the cluster, regarding its shape, tolerances and materials. Contact between the finger and the cluster is guaranteed by type testing: 1000 racking in-out operations.

### Arm and bushing
- The arms cylindrical shape optimizes dielectric strength and avoids the need for any additional insulation.
- The bushing's cylindrical shape gives it outstanding dielectric strength.
- The previously described connectors can be mounted on bushing connection terminals.

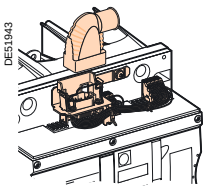
***Comment:***
*Performance levels of the whole assembled unit must be tested by the panel builder. Installation conditions for the two units presented above are described in the Installation Guide. For the 17.5 kV withdrawable circuit breaker, phase to phase distance 185 mm, field deflectors must be added to the bushings.*

### Field deflectors
For circuit breakers with a rated voltage of Ur = 17.5 kV with a phase to phase distance of 185 mm, field deflectors are used to increase the dielectric strength by 75 kV to 95 kV.

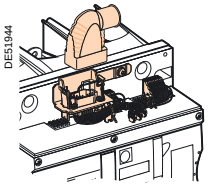
# Description of functions
## LV connection




*LV terminal block*




*18-pin version LV plug*




*42-pin version LV plug*

### Two connection solutions

**Directly on the LV terminal block**
The circuit breaker's LV wiring can be directly connected to the LV terminal block of the operating mechanism through a cable protection duct.

**With LV plug**
- The fixed part (male) mounted on the circuit breaker and fully connected to the operating mechanism
- The mobile part (female) compatible with the male part.

### Two versions of the LV plug are available

**An 18-pin version, enabling connection of:**
- a shunt opening release MX1
- a remote control mechanism (electrical motor, shunt closing release XF, anti-pumping relay)
- a "ready to close" contact PF
- a maximum number of auxiliary contacts: 1 NC - 1 NO - 2 changeover contacts.

*(see "indication" page, "Open/closed position auxiliary contacts" chapter).*

**A 42-pin version, enabling connection of:**
- an opening release (shunt type MX1 or undervoltage type MN)
- a second opening release (shunt type MX2 or undervoltage type MN)
- a low energy release (Mitop)
- a fault trip indicator contact SDE
- a remote contact reset system SDE
- a remote control mechanism (electrical motor, shunt closing release XF)
- a "ready to close" contact PF
- a maximum number of auxiliary contacts: 4 NC - 5 NO - 2 changeover contacts.

*(see "indication" page, "Open/closed position auxiliary contacts" chapter).*

***Note:** see the table of the releases' combinations "Order form" page.*

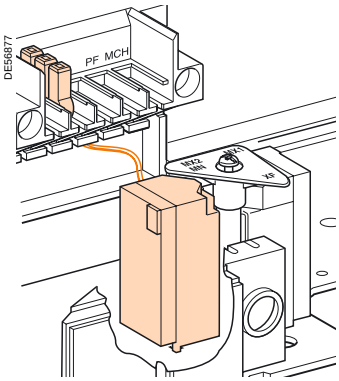
### LV wiring kit
A wiring kit with 21 or 42 wires (2 meters long) equipped with pins that can be adapted to the LV plug can be supplied for connected in to the cubicle's LV compartment.

### Flexible ducting
This 525 mm long duct with a hinged LV plug, enables protection of the LV wiring that connects the circuit breaker to the cubicle's LV compartment.

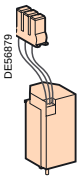
### Interlocking kit
For circuit breakers intended for withdrawable applications, an interlocking kit can be adapted. The kit enables the mechanical position status to be given ("connected/disconnected") of the LV plug. By adding a link between this mechanical data (by the customer) and the open/closed position of the circuit breaker, interlocking can be achieved between the LV plug and the open/closed position of the circuit breaker (required by IEC standard 62271-200).

A detailed explanation of operation is given in the Installation Guide.

# Description of functions
## Opening circuit




*Circuit breaker equipped with a shunt opening release MX*




*Shunt opening release (MX1 and MX2)*

### Composition

The opening circuit is produced using the following components:
- a shunt opening release (MX1)
- a second shunt opening release (MX2)
- an undervoltage release (MN)
- time delayed undervoltage release (MNR: MN + time delay).

The time delay, placed outside the circuit breaker, can be disabled by an emergency stop button to give instant circuit breaker opening.
- low energy release (Mitop).

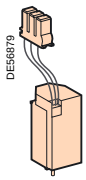
***Note:*** *see the table of the releases' combinations "Order form" page.*

### Shunt opening release (MX1 and MX2)

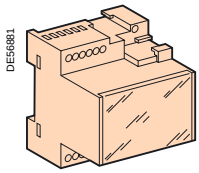
Energizing this release causes instant opening of the circuit breaker.
Permanent power supply to the MX unit locks the circuit breaker in the "open" position.

| Characteristics | | |
|---|---|---|
| Power supply | See "Order form" page | |
| Threshold | 0.7 to 1.1 Un | |
| Consumption (VA or W) | Triggering | 200 (for 200 ms) |
| | Latched | 4.5 |

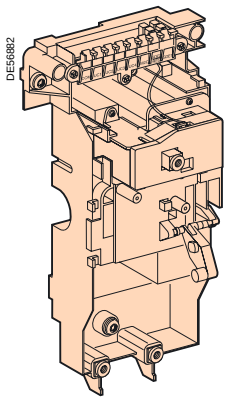
# Description of functions
## Opening circuit (cont.)




*Undervoltage release (MN)*




*Time delay for undervoltage release (MN)*




*Low energy release (Mitop)*

### Undervoltage release (MN)

This release unit causes the systematic opening of the circuit breaker when its supply voltage drops below a value less than 35% of the rated voltage, even if this drop is slow and gradual. It can open the circuit breaker between 35% and 70% of its rated voltage. If the release unit is not supplied power, manual or electrical closing of the circuit breaker is impossible. Closing of the circuit breaker is possible when the supply voltage of the release unit reaches 85% of its rated voltage.

| **Characteristics** | | |
|---|---|---|
| Power supply | See “Order form” page | |
| Threshold | Opening | 0.35 to 0.7 Un |
| | Closing | 0.85 Un |
| Consumption (VA or W) | Triggering | 200 (for 200 ms) |
| | Latched | 4.5 |

### Time delay for MN

To eliminate spurious tripping of the circuit breaker when there are brief voltage drops, the MN action is controlled with a time delay.
This function is achieved by adding a time delay unit outside of the undervoltage release (MN) circuit (adjustable time delay).
This unit is placed outside the circuit breaker and can be inhibited by an emergency stop button to obtain instant circuit breaker opening.

| **Characteristics** | | |
|---|---|---|
| Power supply | See “Order form” page | |
| Threshold | Opening | 0.35 to 0.7 Un |
| | Closing | 0.85 Un |
| Consumption (VA or W) | Triggering | 200 (for 200 ms) |
| | Latched | 4.5 |
| Time delay | 0.5 s - 0.9 s - 1.5 s - 3 s | |

### Low energy release (Mitop)

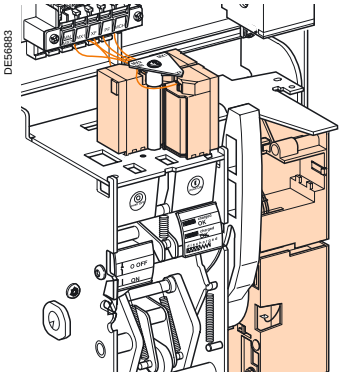
This release includes a low consumption unit and is specifically used with the Sepam 100LA self-powered unit (“REFLEX MODULE”), or the VIP relay.

| **Characteristics** | |
|---|---|
| Power supply | Direct current |
| Threshold | 0.6 A < I < 3 A |

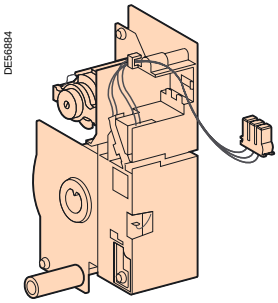
Any tripping due to the Mitop release unit is momentarily indicated by an SDE type changeover contact.
This release also includes a coil (reset) enabling remote SDE contact reset.

***Comment:***
*Use of the Mitop low energy release requires adjustment of the protection relay time delay in order to ensure that the circuit breaker trips between 45-50 ms.*

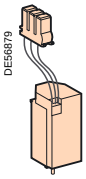
# Description of functions
## Remote control




*Circuit breaker equipped with remote control*




*Electrical motor MCH*




*Shunt release XF/MX*

### Function

Remote control enables the remote opening and closing of the circuit breaker.

The opening order always takes priority over the closing order.
In the event of simultaneous opening and closing orders, the mechanism discharges under no load, without moving the main contacts. The circuit breaker remains in the “open” position.
In the event of latched opening and closing orders, the mechanism carries out anti-pumping function as standard, by blocking the circuit breaker in the “open” position.
Anti-pumping function: after opening on a fault or deliberate opening via the manual or electrical mechanism, the closing order must be interrupted then reactivated to enable reclosing of the circuit breaker.

### Composition

The remote control comprises:
- an electrical motor (MCH) equipped with a “spring armed” limit switch
- a shunt closing release (XF)
- a shunt opening release (MX)
- an operation counter.

It can be added with:
- a “ready to close” contact PF
- a second block of 4 contacts (OC) for O/C position indication for the circuit breaker
- a third block of 4 contacts (OC) for O/C position indication for the circuit breaker.

### Electrical motor (MCH)

The electrical motor carries out the automatic rearming of the storage energy springs as soon as the circuit breaker closes. This allows instant reclosing of the device after opening. The arming lever is only used as a backup control in the case of the absence of the auxiliary power supply.
An electrical motor (MCH) equipped with a “spring armed” limit switch.
This contact indicates the “armed” position of the mechanism (springs armed).

| Characteristics | |
|---|---|
| Power supply | See “Order form” page |
| Threshold | 0.85 to 1.1 Un |
| Consumption (VA or W) | 180 |
| Motor overcurrent | 2 to 3 In for 0.1 s |
| Arming time | 6 s maximum |
| Operating rate | 3 cycles maximum per minute |
| CH contact | 10 A/240 V |

### Shunt releases (XF and MX)

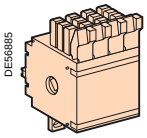
They can be permanently or briefly supplied power.

**Shunt closing release (XF)**
This release allows remote closing of the circuit breaker when the control mechanism is armed.

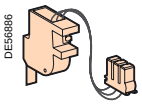
**Shunt opening release (MX)**
This release allows remote opening of the circuit breaker.
It locks it in the “open” position is the order is latched.

| XF/MX characteristics | | |
|---|---|---|
| Power supply | See “Order form” page | |
| Threshold | XF | 0.85 to 1.1 Un |
| | MX | 0.7 to 1.1 Un |
| Consumption (VA or W) | Triggering | 200 (for 200 ms) |
| | Latched | 4.5 |

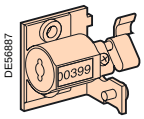
# Description of functions
## Indication



*Rotary type contacts (OC)*



*"Ready to close" PF contact*



*Operation counter (CDM)*

### "Open/closed" auxiliary position contacts (OC)

These auxiliary contacts indicate the "open" or "closed" position of the circuit breaker.

- ■ Rotary type changeover contacts directly controlled by the circuit breaker mechanism.
- ■ Indicator contacts are proposed:
- □ for standard relaying applications
- □ for low level control applications with plc's or electronic circuits.

This version is compatible with Sepam series 20-40-80 units.

| Characteristics | | | |
|---|---|---|---|
| Standard delivery | | | 4 |
| Maximum quantity | | | 12 |
| Breaking capacity (A) | Standard | | Min. load: 100 mA/24 V |
| Cos φ: 0.3 | V AC | 240/380 | 10/6* |
| AC12/DC12 | | 480 | 10/6* |
| | | 690 | 6 |
| | V DC | 24/48 | 10/6* |
| | | 125 | 10/6* |
| | | 250 | 3 |
| | Low level | | Min. load: 2 mA/15 V DC |
| | V AC | 24/48 | 6 |
| | | 240 | 6 |
| | | 380 | 3 |
| | V DC | 24/48 | 6 |
| | | 125 | 6 |
| | | 250 | 3 |

* Standard contacts: 10 A; optional contacts: 6 A (temperature derating)

### "Ready to close" PF contact

The circuit breaker is "ready to close" when shown by a mechanical indicator and a PF changeover contact.
This information simultaneously indicates that:

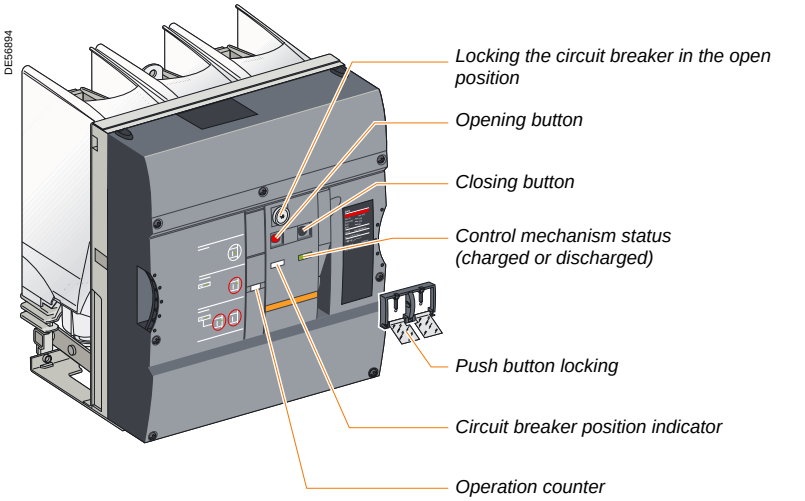
- ■ the circuit breaker is open
- ■ the storage energy springs are armed
- ■ there is no permanent closing order
- ■ there is no permanent opening order caused by:
- □ a safety opening order (2nd MX or MN)
- □ keylocking of the device in the open position.

| Characteristics | | | |
|---|---|---|---|
| Standard delivery | | | 0 |
| Maximum quantity | | | 1 |
| Breaking capacity (A) | Standard | | Min. load: 100 mA/24 V |
| Cos φ: 0.3 | V AC | 240/380 | 5 |
| AC12/DC12 | | 480 | 5 |
| | | 690 | 3 |
| | V DC | 24/48 | 3 |
| | | 125 | 0.3 |
| | | 250 | 0.15 |
| | Low level | | Min. load: 2 mA/15 V DC |
| | V AC | 24/48 | 3 |
| | | 240 | 3 |
| | | 380 | 3 |
| | V DC | 24/48 | 3 |
| | | 125 | 0,3 |
| | | 250 | 0,15 |

### Operation counter (CDM)

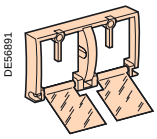
The operation counter is visible on the front panel.
It totalizes the number of switching cycles (CO) that the device has carried out.

# Description of functions
## Locking/interlocking

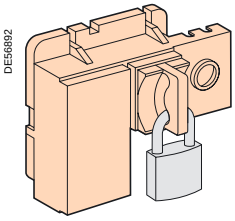



### Push button locking

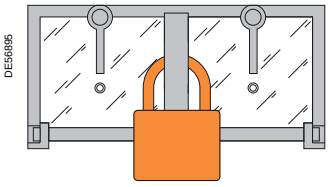
This transparent screen blocks access to the opening and closing push-buttons on the circuit breaker.
The device enables the opening or closing push button to be locked independently. It is often associated with an electrical motor (MCH).
Locking is achieved either:
- by 2 screws
- by 3 padlocks, not supplied
- by a lead seal.



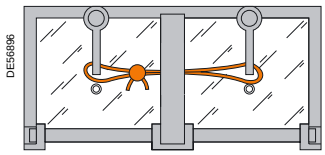
*Push button locking*



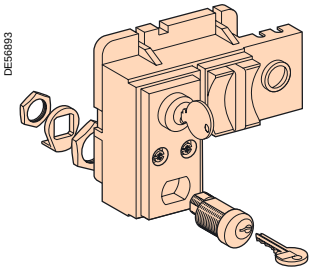
*Padlocking of the circuit breaker in the “open” position*



*Padlocking*



*Lead sealing*



*Keylocking of the circuit breaker in the “open” position*

### Locking of the circuit breaker in the “open” position

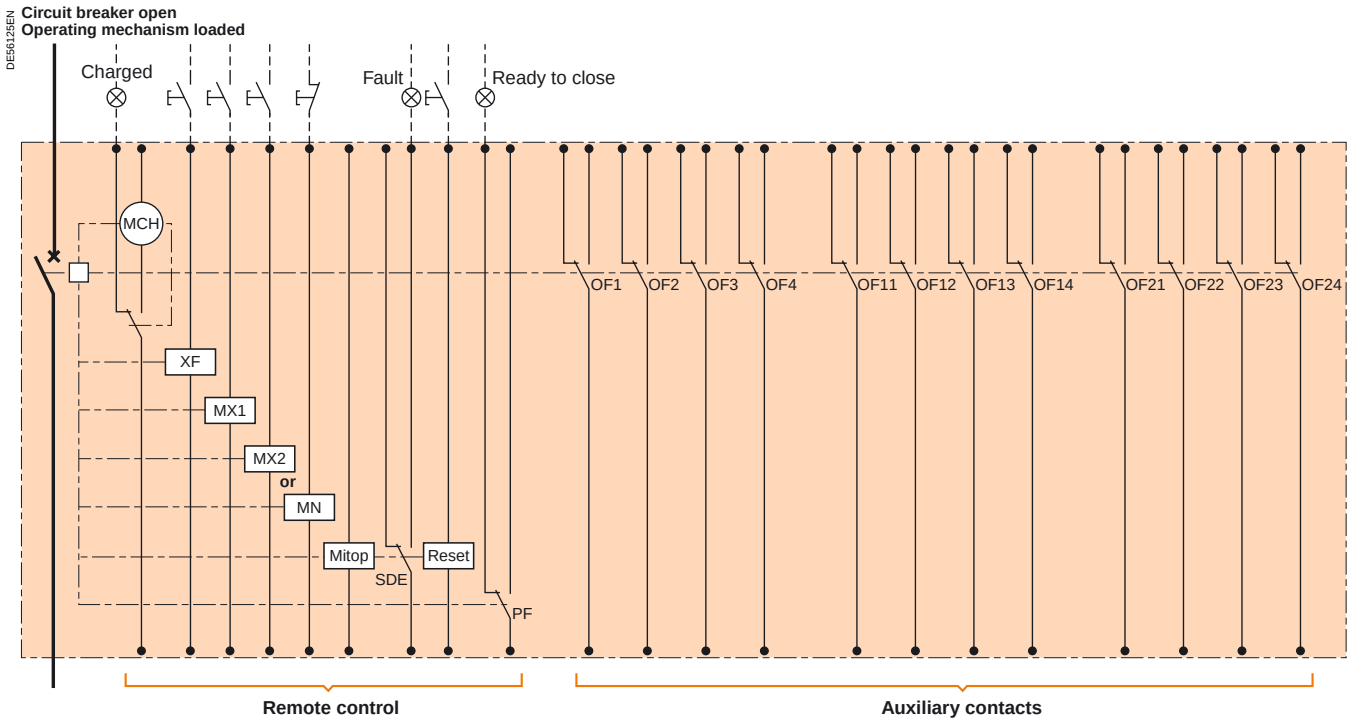
The circuit breaker is locked in the “open” position by blocking the opening push button in the engaged position:
- by a padlock 1 to 3 padlocks, not supplied
- by a keylocks 1 or 2 different keylocks, not supplied

The keylocks are of captive key type, with the key free after locking, either Profalux or Ronis (right turn), and are proposed according to the options either with:
- 1 single keylock
- 1 single keylock mounted on the circuit breaker + 1 identical delivered separately for interlocking with another device
- 2 different keylocks for double locking.

Profalux and Ronis keylocks are inter-compatible.

# Description of functions
## Wiring diagram

### Wiring diagram (principle)



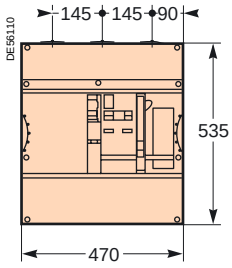

*MCH: electrical motor*
*XF: shunt closing release*
*MX1: shunt opening release*
*MX2: shunt opening release*
***or** MN: undervoltage release*
*Mitop: low energy release*
*SDE: electrical fault signal contact*
*Reset: remote SDE contact reset*
*PF: "ready to close" contact*

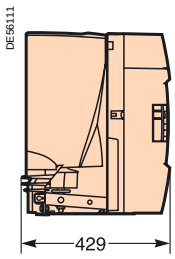
# Dimensions

## Device:

### Phase to phase distance 145 mm

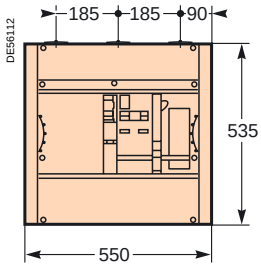
| Ur | Isc | Ir | Weight |
|---|---|---|---|
| 7.2 kV | 25 kA | 630 A | 51 kg |
| | | 1250 A | |
| 12 kV | 25 kA | 630 A | |
| | | 1250 A | |

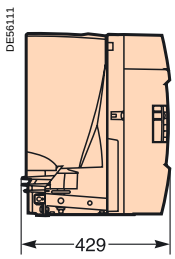



### Phase to phase distance 185 mm

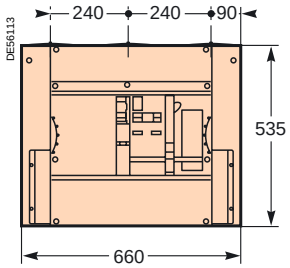
| Ur | Isc | Ir | Weight |
|---|---|---|---|
| 7.2 kV | 25 kA | 630 A | 55 kg |
| | | 1250 A | |
| | 31.5 kA | 630 A | |
| | | 1250 A | |
| 12 kV | 25 kA | 630 A | |
| | | 1250 A | |
| | 31.5 kA | 630 A | |
| | | 1250 A | |
| 17.5 kV | 25 kA | 630 A | |
| | | 1250 A | |
| | 31.5 kA | 630 A | |
| | | 1250 A | |

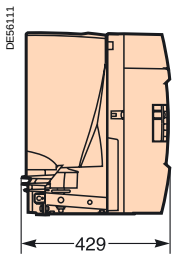



### Phase to phase distance 240 mm

| Ur | Isc | Ir | Weight |
|---|---|---|---|
| 7.2 kV | 25 kA | 2500 A | 79 kg |
| | 31.5 kA | 2500 A | |
| | 40 kA | 630 A | |
| | | 1250 A | |
| | | 2500 A | |
| 12 kV | 25 kA | 2500 A | |
| | 31.5 kA | 2500 A | |
| | 40 kA | 630 A | |
| | | 1250 A | |
| | | 2500 A | |
| 17.5 kV | 25 kA | 2500 A | |
| | 31.5 kA | 2500 A | |
| | 40 kA | 630 A | |
| | | 1250 A | |
| | | 2500 A | |



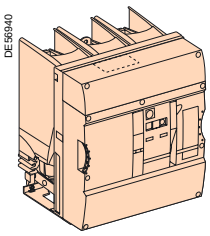

**Important**
Detailed installation instructions are given in the “Evolis Installation Guide”. Please consult us.

# Offer structure

**The basic fixed, frontal circuit breaker includes:**
- a manual operating mechanism (spring type)
- 1 shunt opening release MX
- 1 block of 4 ON/OFF indication contacts.

**The circuit breaker can receive options.**

## Basic fixed, frontal circuit breaker




| Phase distance (mm) | | | 145 | 185 | 240 |
|---|---|---|---|---|---|
| **7.2 kV** | 25 kA | 630 A | ■ | ■ | |
| | | 1250 A | ■ | ■ | |
| | | 2500 A | | | ■ |
| | 31.5 kA | 630 A | | ■ | |
| | | 1250 A | | ■ | |
| | | 2500 A | | | ■ |
| | 40 kA | 630 A | | | ■ |
| | | 1250 A | | | ■ |
| | | 2500 A | | | ■ |
| **12 kV** | 25 kA | 630 A | ■ | ■ | |
| | | 1250 A | ■ | ■ | |
| | | 2500 A | | | ■ |
| | 31.5 kA | 630 A | | ■ | |
| | | 1250 A | | ■ | |
| | | 2500 A | | | ■ |
| | 40 kA | 630 A | | | ■ |
| | | 1250 A | | | ■ |
| | | 2500 A | | | ■ |
| **17.5 kV** | 25 kA | 630 A | | ■ | |
| | | 1250 A | | ■ | |
| | | 2500 A | | | ■ |
| | 31.5 kA | 630 A | | ■ | |
| | | 1250 A | | ■ | |
| | | 2500 A | | | ■ |
| | 40 kA | 630 A | | | ■ |
| | | 1250 A | | | ■ |
| | | 2500 A | | | ■ |

# Offer structure (cont.)

## Circuit breaker options

**Remote control** (see possible choices in combination table below)

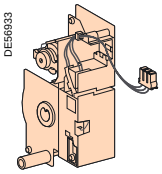


*Fig. 1*

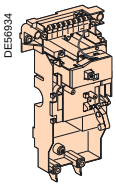


*Fig. 2*

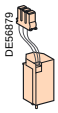


*Fig. 3*

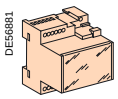


*Fig. 4*

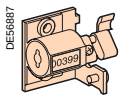


*Fig. 5*

**1st opening release**

Possibility of replacing MX by undervoltage release **MN** *(fig. 3)*

Possibility of replacing MX by low energy release **Mitop** *(fig. 2)*

**2nd opening release**

Shunt opening release **MX** (circuit breaker opening) *(fig. 3)*

Undervoltage release **MN** (circuit breaker opening) *(fig. 3)*

Time delay unit for **MN** (setting 0.5, 0.9, 1.5, 3 s) *(fig. 4)*

Low energy release **Mitop** *(fig. 2)*
1 AC fault signalling SDE and reset 200…250 Vac are included

**Remote control including:**

Electrical motor **MCH** and shunt closing release **XF** and operation counter **CDM** *(fig. 1, 3 & 5)*

*Releases combinations table*

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| MX | 1 | | | 2 | 1 | 1 | | 2 | 1 |
| MN | | 1 | | | 1 | | 1 | | 1 |
| Mitop | | | 1 | | | 1 | 1 | 1 | 1 |

## Indication

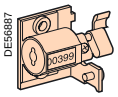


*Fig. 1*

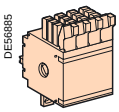


*Fig. 2*

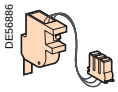


*Fig. 3*

Operation counter **CDM** *(fig. 1)*

Additional auxiliary contacts **OF** (4 AC) *(fig. 2)*

Ready to close contact **PF** (1 AC) *(fig. 3)*

## LV wiring connection

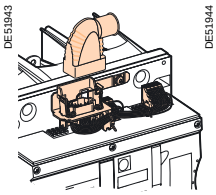


*Fig. 1*

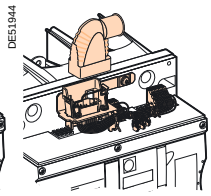


*Fig. 2*

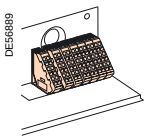


*Fig. 3*

Standard plug 18 pins *(fig. 1)*

All options plug 42 pins *(fig. 2)*

Low voltage terminal blocks *(fig. 3)*
42 pins or terminal blocks are **mandatory** if more than one opening coil is needed

## Locking/interlocking

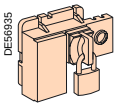


*Fig. 1*

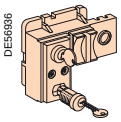


*Fig. 2*

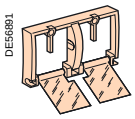


*Fig. 3*

Locking of the circuit breaker in the open position by padlock (padlock supplied by customer) *(fig. 1)*

Locking of the circuit breaker in the open position by key locks *(fig. 2)* — 1 lock / 2 locks

Disabling of O/C circuit breaker buttons (padlock supplied by customer) *(fig. 3)*

# Order form

Only one of the boxes (ticked [X] or filled [ ] by the needed value) have to be considered between each horizontal line.
Orange box [X] corresponds to none priced functions.

## Basic fixed, frontal circuit breaker

Quantity [ ]

**Rated voltage Ur** (kV) [ ]

**Rated short-circuit breaking current Isc** (kA) [ ]

**Rated normal current Ir** (A) [ ]

**Phase distance (mm)** 145 [ ] 185 [ ] 240 [ ]

**Colour for push buttons and indicators** IEC standard [X] ANSI standard [X]

## Circuit breaker options

### 1st opening release (see possible choices in combination table below)

Shunt opening release - **MX**

| | | |
|---|---|---|
| 24 Vac [X] | 24…30 Vdc [X] | 100…130 Vdc/ac [X] |
| 48 Vac [X] | 48…60 Vdc [X] | 200…250 Vdc/ac [X] |

Undervoltage release - **MN**

| | | |
|---|---|---|
| 24 Vac [ ] | 24…30 Vdc [ ] | 100…130 Vdc/ac [ ] |
| 48 Vac [ ] | 48…60 Vdc [ ] | 200…250 Vdc/ac [ ] |

Time delay unit for **MN**

| | | |
|---|---|---|
| 48…60 Vdc/ac [ ] | 100…130 Vdc/ac [ ] | 200…250 Vdc/ca [ ] |

Low energy release **Mitop**
1 AC fault signalling SDE and reset 200...250 Vac are included [ ]

### 2nd opening release (a low voltage plug and socket 42 pins is mandatory)

Shunt opening release - **MX**

| | | |
|---|---|---|
| 24 Vac [ ] | 24…30 Vdc [ ] | 100…130 Vdc/ac [ ] |
| 48 Vac [ ] | 48…60 Vdc [ ] | 200…250 Vdc/ac [ ] |

Undervoltage release - **MN**

| | | |
|---|---|---|
| 24 Vac [ ] | 24…30 Vdc [ ] | 100…130 Vdc/ac [ ] |
| 48 Vac [ ] | 48…60 Vdc [ ] | 200…250 Vdc/ac [ ] |

Time delay unit for **MN**

| | | |
|---|---|---|
| 48…60 Vdc/ac [ ] | 100…130 Vdc/ac [ ] | 200…250 Vdc/ca [ ] |

Low energy release **Mitop**
1 AC fault signalling SDE and reset 200...250 Vac are included [ ]

### Remote control (operation counter already included)

Electrical motor - **MCH**

| | | |
|---|---|---|
| 24…30 Vdc [ ] | 100…125 Vdc [ ] | 200…250 Vdc [ ] |
| 48…60 Vdc/ac [ ] | 100…130 Vac [ ] | 200…240 Vac [ ] |

Shunt closing release - **XF**

| | | |
|---|---|---|
| 24 Vac [X] | 24…30 Vdc [X] | 100…130 Vdc/ac [X] |
| 48 Vac [X] | 48…60 Vdc [X] | 200…250 Vdc/ac [X] |

**Operation counter CDM** (already included if remote control supplied) [ ]

**Additional auxiliary contacts OF** (4 AC) 1 [ ] 2 [ ]

**Ready to close contact PF** (1 AC) [ ]

**LV plug** 18 pins LV plug [ ] 42 pins LV plug [ ] LV terminal blocks [ ]

**Locking of the circuit breaker in the open position**

By padlock [ ]

or by locks and keys Profalux [X] Ronis [X]

If locks 1 lock [ ] 2 identical locks [ ] 2 different locks [ ]

**Disabling of O/C circuit breaker push buttons** [ ]

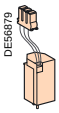
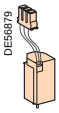
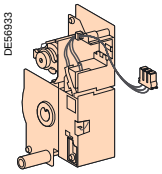
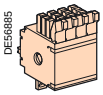
*Releases combinations table*

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Shunt opening MX | 1 | | | 2 | 1 | 1 | | 2 | 1 |
| Undervoltage MN | | 1 | | | 1 | | 1 | | 1 |
| Mitop | | | 1 | | | 1 | 1 | 1 | 1 |

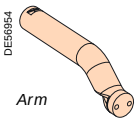
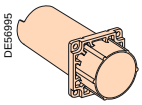
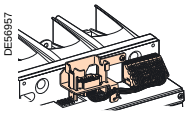
# Offer structure
## Separated components

*The following components can be ordered separately and can be adapted or replaced by the customer.*

### Remote control

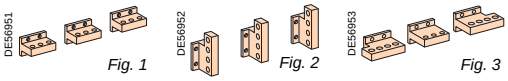
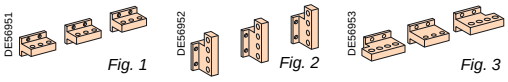
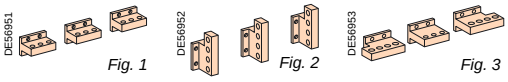
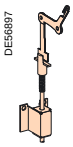
| | | | Ref. |
|---|---|---|---|
| **MX1, MX2, XF shunt opening/closing release** | | | |
|  DE56879 | 24…30 Vdc | 24 V 50/60 Hz | **59141** |
| | 48…60 Vdc | 48 V 50/60 Hz | **59142** |
| | 100…130 Vac - 50/60 Hz | | **59143** |
| | 200…250 Vac - 50/60 Hz | | **59144** |
| **MN undervoltage release** | | | |
|  DE56879 | 24…30 Vdc | 24 V 50/60 Hz | **33668** |
| | 48…60 Vdc | 48 V 50/60 Hz | **33669** |
| | 100…130 Vac - 50/60 Hz | | **33670** |
| | 200…250 Vac - 50/60 Hz | | **33671** |
| **MCH electrical motor** | | | |
|  DE56933 | 24…30 Vdc | | **47888** |
| | 48…60 Vdc | | **47889** |
| | 100…125 Vdc | | **47890** |
| | 200…250 Vdc | | **47891** |
| | 48…60 Vac - 50/60 Hz | | **47889** |
| | 100…130 Vac - 50/60 Hz | | **47893** |
| | 200…240 Vac - 50/60 Hz | | **47894** |
| **Additional auxiliary contacts** | | | |
|  DE56885 | 4 AC | | **47887** |

### MV and LV connection accessories

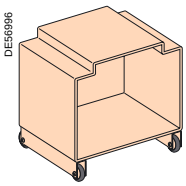
| | | | Ref. |
|---|---|---|---|
| **MV connection accessories** | | | |
|  DE56954 *Arm* DE56955 *Cluster* DE56956 *Finger* | 3 clusters + 3 fingers | 630-1250 A | **59369** |
| | 3 clusters + 3 fingers | 630-2500 A | **59371** |
| | 3 arms | 630-1250 A | **59396** |
| | 3 arms | 630-2500 A | **59397** |
| **Bushings** | | | |
|  DE56995 | 1 full bushing 630-1250 A | | **59382** |
| | 1 full bushing 630-2500 A | | **59383** |
| | (you need at least 6 bushings per cradle) | | |
| **Field deflectors for bushings** | | | |
| DE56939 | 6 deflectors used to increase dielectric withstand from 75 to 95 kV | | **59283** |
| **LV plug** | | | |
|  DE56957 | Standard (18 pins) | | **59114** |
| | All options (42 pins) | | **59115** |
| **LV terminal blocks** | | | |
| DE56958 | 1 terminal block | | **47074** |
| **LV wiring** | | | |
| | 21 marked LV wires fitted in socket type pins | | **59117** |

# Offer structure
## Separated components (cont.)

### Other circuit breaker accessories

| | | Ref. |
|---|---|---|
| **Upstream and downstream fixed connections, Ir** (to be mounted on basic circuit breaker or bushings) | | |
|  *Fig. 1* *Fig. 2* *Fig. 3* | 3 fixed distance H or V *(fig. 1)* | 630-1250 A | **59400** |
| | 3 variable distance H *(fig. 3)* | 630-1250 A | **59401** |
| | 3 variable distance V *(fig. 2)* | 630-1250 A | **59402** |
| **Upstream fixed connections, Ir** (to be mounted on basic circuit breaker or bushings) **or downstream fixed connections, Ir** (to be mounted on bushings only) | | | |
|  *Fig. 1* *Fig. 2* *Fig. 3* | 3 fixed distance H or V *(fig. 1)* | 630-2500 A | **59403** |
| | 3 variable distance H *(fig. 3)* | 630-2500 A | **59404** |
| | 3 variable distance V *(fig. 2)* | 630-2500 A | **59405** |
| **Downstream fixed connections, Ir** (to be mounted on basic circuit breaker only) | | | |
|  *Fig. 1* *Fig. 2* *Fig. 3* | 3 fixed distance H or V *(fig. 1)* | 630-2500 A | **59409** |
| | 3 variable distance H *(fig. 3)* | 630-2500 A | **59410** |
| | 3 variable distance V *(fig. 2)* | 630-2500 A | **59411** |
| **Labels kit for push button and indicator (O/C)** | | | |
| | Circuit breaker specific labels green, red, etc. | | **59100** |
| **Circuit breaker opening external device** | | | |
|  | Adaptation kit needed for circuit breaker opening (for retrofit) | | **59093** |

### Various

| | | Ref. |
|---|---|---|
| **Circuit breaker support frame** | | |
|  | Drawings and casters | **59050** |
| **Technical documentation** | | |
| | User manual | **59069** |

# Services

**The following components can only be adapted or replaced on site by staff trained by Schneider Electric:**

- remote control mechanism (comprising: electrical motor, shunt closing release, operation counter)
- operation counter
- low energy release (Mitop)
- circuit breaker front cover.

# Evolis 17.5 kV withdrawable, frontal version

*Panorama* *11*
*Evolis 17.5 kV fixed, frontal version* *15*

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*Evolis and EVOset 24 kV fixed, lateral version* *87*
*Evolis Pilot monitoring device* *109*

# Main characteristics

PE55101

## Electrical characteristics according to IEC 62271-100

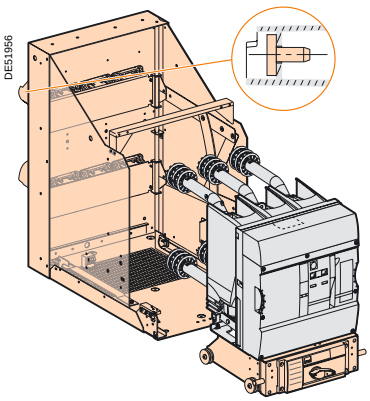
| **Ur 7.2 kV** | **Isc** | **Ir** | | | |
|---|---|---|---|---|---|
| **Phase to phase distance (mm)** | | | **145** | **185** | **240** |
| Ud 20 kV 50 Hz, 1 min | 25 kA | 630 A | ■ | ■ | |
| Up 60 kV peak | | 1250 A | ■ | ■ | |
| | | 2500 A | | | ■ |
| | 31.5 kA | 630 A | | ■ | |
| | | 1250 A | | ■ | |
| | | 2500 A | | | ■ |
| | 40 kA | 630 A | | | ■ |
| | | 1250 A | | | ■ |
| | | 2500 A | | | ■ |
| **Ur 12 kV** | **Isc** | **Ir** | | | |
| **Phase to phase distance (mm)** | | | **145** | **185** | **240** |
| Ud 28 kV 50 Hz, 1 min | 25 kA | 630 A | ■ | ■ | |
| Up 75 kV peak | | 1250 A | ■ | ■ | |
| | | 2500 A | | | ■ |
| | 31.5 kA | 630 A | | ■ | |
| | | 1250 A | | ■ | |
| | | 2500 A | | | ■ |
| | 40 kA | 630 A | | | ■ |
| | | 1250 A | | | ■ |
| | | 2500 A | | | ■ |
| **Ur 17.5 kV** | **Isc** | **Ir** | | | |
| **Phase to phase distance (mm)** | | | **145** | **185** | **240** |
| Ud 38 kV 50 Hz, 1 min | 25 kA | 630 A | | ■ | |
| Up 95 kV peak | | 1250 A | | ■ | |
| | | 2500 A | | | ■ |
| | 31.5 kA | 630 A | | ■ | |
| | | 1250 A | | ■ | |
| | | 2500 A | | | ■ |
| | 40 kA | 630 A | | | ■ |
| | | 1250 A | | | ■ |
| | | 2500 A | | | ■ |

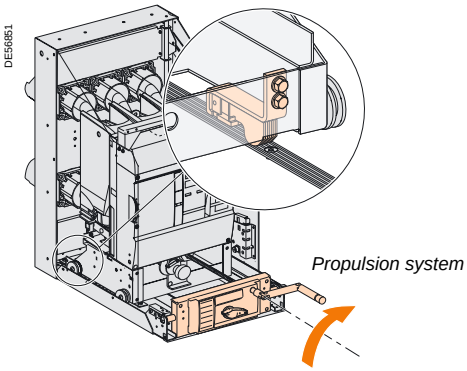
## Additional characteristics according to IEC 62271-100

| **Rated values** | | | |
|---|---|---|---|
| Voltage | **Ur** | kV rms | 7.2-12-17.5 |
| Insulation voltage: | | | |
| - power frequency withstand | **Ud** | kV rms | 20-28-38 |
| - lightning impulse withstand | **Up** | kV peak | 60-75-95 |
| Frequency | **fr** | Hz | 50-60 |
| Short time withstand current | **Ik/tk** | kA | Isc/3 s |
| Peak withstand current | **Ip** | kA peak | 2.5 Isc (50 Hz) |
| | | | 2.6 Isc (60 Hz) |
| Short circuit making capacity | | kA peak | 2.5 Isc (50 Hz) |
| | | | 2.6 Isc (60 Hz) |

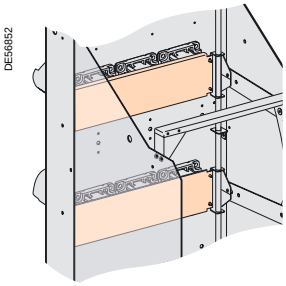
| **Other characteristics** | | |
|---|---|---|
| Operating sequence | | O-0.3 s-CO-15 s-CO |
| | | O-0.3 s-CO-3 min-CO |
| | | O-3 min-CO-3 min-CO |
| Operating times | Opening | < 50 ms |
| | Breaking | < 60 ms |
| | Closing | < 65 ms |
| Mechanical endurance | Class | M2 |
| | Number of switching operations | 10000 |
| Electrical endurance | Class | E2 |
| Number of switching operations at full Isc value | 25 kA | 100 |
| | 31.5 kA | 50 |
| | 40 kA | 30 |
| Capacitive current breaking capacity | Class | C1 |
| Operating conditions | | –25°C to +40°C |
| Average relative humidity | Over 24 h | < 95% |
| | Over 1 month | < 90% |

# Description of functions
## Racking in

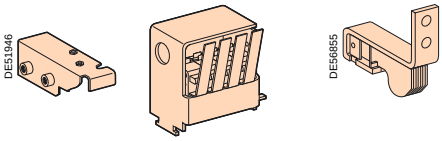


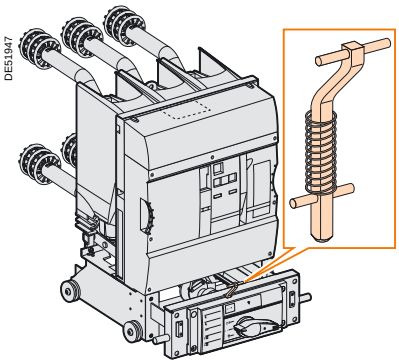

*Propulsion system*




*Shutters*




*Circuit breaker position contact locked* | *Racked in/out contacts* | *Earthing sliding device*




*Door locking mechanism*

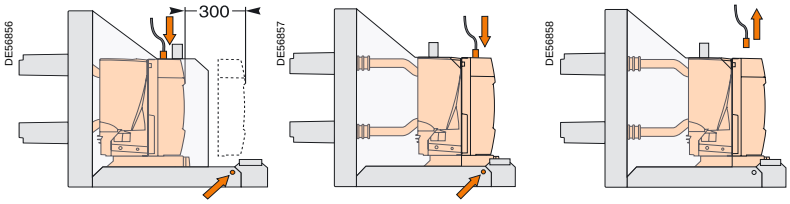
### Composition

The “racking in” function is carried out by:
- the racking truck supporting the circuit breaker (mobile part)
- the cradle with bushings (fixed part)
- LV plug.

### Operation

The circuit breaker can be placed in 3 stable positions:
- **service position:** circuit breaker racked in and locked in position; LV plugs connected
- **test position:** circuit breaker racked out and locked in position; LV plug connected
- **disconnected position:** the circuit breaker can be unlocked and extracted from the cubicle.

**3 stable states for operating**




*Service position* | *Test position* | *Disconnected position*

***Note:** the arrows show the “locked positions” for the circuit breaker and the LV plug.*

### Functions

- A drive system combined with a threaded shaft gives easier racking in and out.

The racking in mechanism can be operated with the door closed.
An interlock stops the user from inserting the lever as long as the racking truck has not been put in the “racked in/out” position.

- An interlock between the circuit breaker status and the truck gives secure operation: racking in or out is only possible if the circuit breaker is open.
- An interlock also exists between the LV connector and the truck. It is only possible to rack in if the LV connector is connected.

The cradle floor has all the fixing holes needed to correctly position the earthing switch control mechanism and power circuit. This makes earthing switch operation reliable and gives interlocking between the circuit breaker and the earthing switch.

- Earthing is automatic when the truck is fully racked in.
- Protective shutters stop fingers from touching the racking clusters when the device is extracted (protection index: IP2X).
- For maintenance operations, it is possible to:
  - padlock the shutters in the closed position
  - unlock the shutter mechanism to access the racking clusters.
- A foolproof device enables correct matching of the cradle and circuit breaker rating.

This system is mounted on the cradle base. Part of the system must be assembled by the panel builder on the cubicle floor.

### Accessories

- One set of auxiliary contacts:
  - 4 circuit breaker racked in/out position contacts
  - 1 contact showing that the circuit breaker is locked in place on the cradle.
- Cradle earthing is provided by a sliding copper contact.
- A key locking system (Ronis or Profalux) for the circuit breaker in the racked out position enables increased safety downstream of it during work.

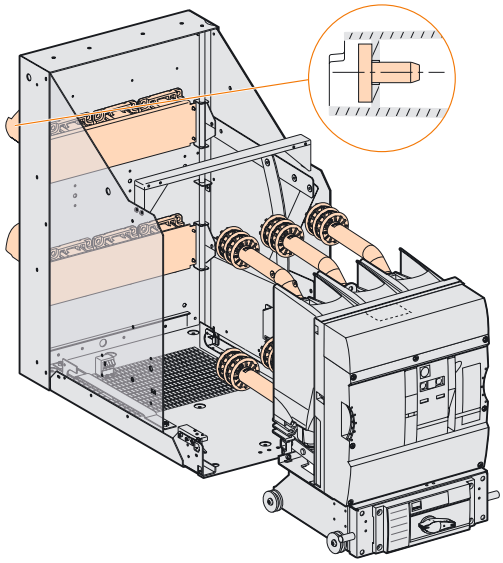
This system is associated with an earthing switch.

- Locking of the circuit breaker compartment door.

This device enables the circuit breaker, full version, to only be operated when the door is closed.

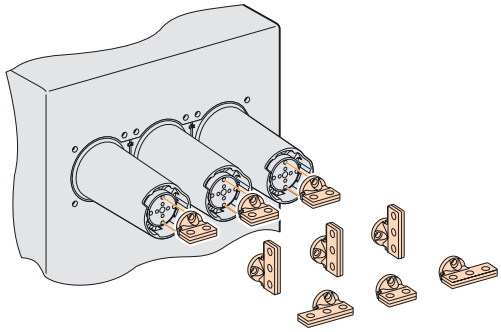
# Description of functions
## MV connection

DE51942



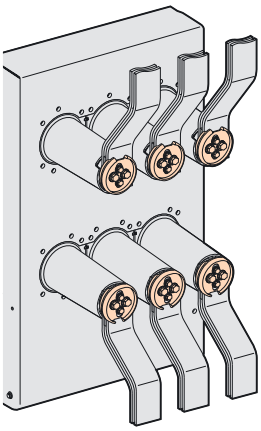
*Power circuit*

DE56847



*3 connector sets*

DE56849



*Field deflectors*

### Composition

The power circuit comprises:

- mobile contacts with disconnectable clusters and arms mounted on the circuit breaker
- fingers attached to the cradle and insulated by bushings and metal shutters.

This assembly provides perfect control of the dielectric strength, mechanic, the short time withstand current and the temperature rise.
All of these characteristics have been validated in tests.

### Connection

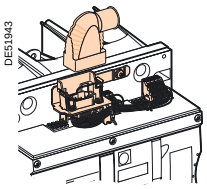
Connection is easily done from outside the cradle:

- on vertical copper terminals integrated in the bushing
- by a connector set, also used on the base circuit breaker.

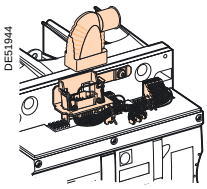
***Note:***
*The dielectric strength values given in the performance table, do not take these connectors into account.*
*The panel builder must check the whole cubicle connection configuration.*

For circuit breakers with a rated voltage of Ur = 17.5 kV with a phase to phase distance of 185 mm, field deflectors are used to increase the dielectric strength by 75 kV to 95 kV.

# Description of functions
## LV connection


DE51943

*18-pin version LV plug*


DE51944

*42-pin version LV plug*

### Main functions
With the base circuit breaker, the LV wiring uses a LV plug which comprises:
- the fixed part (male) mounted on the circuit breaker and fully connected to the control mechanism
- the mobile part (female) compatible with the male part.

### Two versions of the LV plug are available

**An 18-pin version, enabling connection of:**
- a shunt opening release MX1
- a remote control mechanism (electrical motor, shunt closing release XF)
- a “ready to close” contact PF
- a maximum number of auxiliary contacts: 1 NC - 1 NO - 2 changeover contacts.

*(see “indication” page, “Open/closed position auxiliary contacts” chapter).*

**An 42-pin version, enabling connection of:**
- a shunt opening release MX1
- a second opening release (shunt type MX2 or undervoltage type MN)
- a low energy release (Mitop)
- a fault trip indicator contact SDE
- a remote contact reset system SDE
- a remote control mechanism (electrical motor, shunt closing release XF)
- a “ready to close” contact PF
- a maximum number of auxiliary contacts: 4 NC - 5 NO - 2 changeover contacts.

*(see “indication” page, “Open/closed position auxiliary contacts” chapter).*

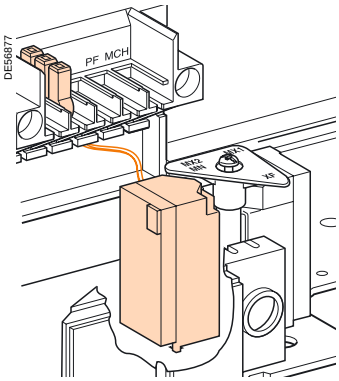
***Note:** see the table of the releases’ combinations “Order form” page.*

**Interlocking function:**
In conformity with IEC standard 62271-200, an interlocking function prohibits:
- racking in when the LV plug is not connected
- disconnection of the LV plug if the circuit breaker is in the racked-in position.

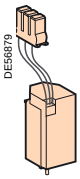
### LV wiring kit
A wiring kit with 21 or 42 wires (2 meters long) equipped with pins that can be adapted to the LV plug can be supplied for connected in to the cubicle’s LV compartment.

### Flexible ducting
This 525 mm long duct with a hinged LV plug, enables protection of the LV wiring that connects the circuit breaker to the cubicle’s LV compartment.

# Description of functions
## Opening circuit




*Circuit breaker equipped with a shunt opening release MX*




*Shunt opening release (MX1 and MX2)*

### Composition

In its basic version, the circuit breaker includes a shunt opening release (MX1)
The opening circuit can also be produced using the following components:

- a second shunt opening release MX2
- undervoltage release (MN)
- time delayed undervoltage release (MNR: MN + time delay).

The time delay, placed outside the circuit breaker, can be disabled by an emergency stop button to give instant circuit breaker opening.

- low energy release (Mitop).

***Note:*** *see the table of the releases' combinations "Order form" page.*

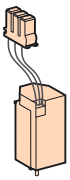
### Shunt opening release (MX1 and MX2)

Energizing this release causes instant opening of the circuit breaker.
Permanent power supply to the MX unit locks the circuit breaker in the "open" position.

| Characteristics | | |
|---|---|---|
| Power supply | See "Order form" page | |
| Threshold | 0.7 to 1.1 Un | |
| Consumption (VA or W) | Triggering | 200 (for 200 ms) |
| | Latched | 4.5 |

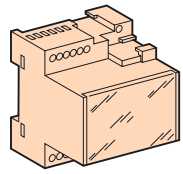
# Description of functions
## Opening circuit (cont.)

DE56879



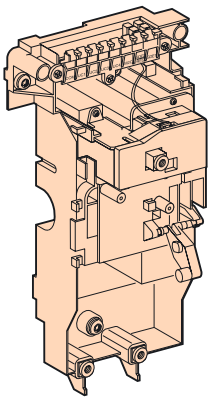
*Undervoltage release (MN)*

DE56881



*Time delay for undervoltage release (MN)*

DE56882



*Low energy release (Mitop)*

### Undervoltage release (MN)

This release unit causes the systematic opening of the circuit breaker when its supply voltage drops below a value less than 35% of the rated voltage, even if this drop is slow and gradual. It can open the circuit breaker between 35% and 70% of its rated voltage. If the release unit is not supplied power, manual or electrical closing of the circuit breaker is impossible. Closing of the circuit breaker is possible when the supply voltage of the release unit reaches 85% of its rated voltage.

| **Characteristics** | | |
|---|---|---|
| Power supply | See “Order form” page | |
| Threshold | Opening | 0.35 to 0.7 Un |
| | Closing | 0.85 Un |
| Consumption (VA or W) | Triggering | 200 (for 200 ms) |
| | Latched | 4.5 |

### Time delay for MN

To eliminate spurious tripping of the circuit breaker when there are brief voltage drops, the MN action is controlled with a time delay.
This function is achieved by adding a time delay unit outside of the undervoltage release (MN) circuit (adjustable time delay).
This unit is placed outside the circuit breaker and can be inhibited by an emergency stop button to obtain instant circuit breaker opening.

| **Characteristics** | | |
|---|---|---|
| Power supply | See “Order form” page | |
| Threshold | Opening | 0.35 to 0.7 Un |
| | Closing | 0.85 Un |
| Consumption (VA or W) | Triggering | 200 (for 200 ms) |
| | Latched | 4.5 |
| Time delay | 0.5 s - 0.9 s - 1.5 s - 3 s | |

### Low energy release (Mitop)

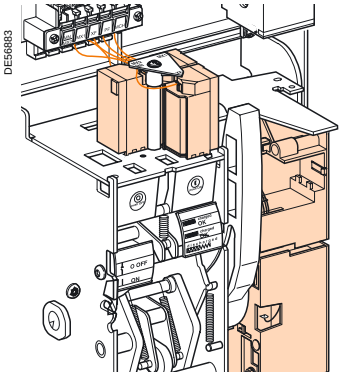
This release includes a low consumption unit and is specifically used with the Sepam 100LA self-powered unit (“REFLEX MODULE”), or the VIP relay.

| **Characteristics** | |
|---|---|
| Power supply | Direct current |
| Threshold | 0.6 A < I < 3 A |

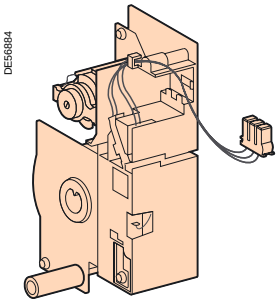
Any tripping due to the Mitop release unit is momentarily indicated by an SDE type changeover contact.
This release also includes a coil (reset) enabling remote SDE contact reset.

***Comment:***
*Use of the Mitop low energy release requires adjustment of the protection relay time delay in order to ensure that the circuit breaker trips between 45-50 ms.*

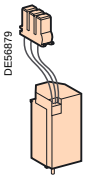
# Description of functions
## Remote control




*Circuit breaker equipped with remote control*




*Electrical motor MCH*




*Shunt release XF/MX*

### Function
Remote control enables the remote opening and closing of the circuit breaker.

The opening order always takes priority over the closing order.
In the event of simultaneous opening and closing orders, the mechanism discharges under no load, without moving the main contacts. The circuit breaker remains in the “open” position.
In the event of latched opening and closing orders, the mechanism carries out anti-pumping function as standard, by blocking the circuit breaker in the “open” position.
Anti-pumping function: after opening on a fault or deliberate opening via the manual or electrical mechanism, the closing order must be interrupted then reactivated to enable reclosing of the circuit breaker.

### Composition
The remote control comprises:
- an electrical motor (MCH) equipped with a “spring armed” CH limit switch
- a shunt closing release (XF)
- a shunt opening release (MX)
- an operation counter.

It can be added with:
- a “ready to close” contact PF
- a second block of 4 contacts (OC) for O/C position indication for the circuit breaker
- a third block of 4 contacts (OC) for O/C position indication for the circuit breaker.

### Electrical motor (MCH)
The electrical motor carries out the automatic rearming of the storage energy springs as soon as the circuit breaker closes. This allows instant reclosing of the device after opening. The arming lever is only used as a backup control in the case of the absence of the auxiliary power supply.
An electrical motor (MCH) equipped with a “spring armed” CH limit switch.
This contact indicates the “armed” position of the mechanism (springs armed).

| **Characteristics** | |
|---|---|
| Power supply | See “Order form” page |
| Threshold | 0.85 to 1.1 Un |
| Consumption (VA or W) | 180 |
| Motor overcurrent | 2 to 3 In for 0.1 s |
| Arming time | 6 s maximum |
| Operating rate | 3 cycles maximum per minute |
| CH contact | 10 A/240 V |

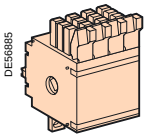
### Shunt releases (XF and MX)
They can be permanently or briefly supplied power.

**Shunt closing release (XF)**
This release allows remote closing of the circuit breaker when the control mechanism is armed.

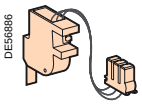
**Shunt opening release (MX)**
This release allows remote opening of the circuit breaker.
It locks it in the “open” position if the order is latched.

| **XF/MX characteristics** | | |
|---|---|---|
| Power supply | See “Order form” page | |
| Threshold | XF | 0.85 to 1.1 Un |
| | MX | 0.7 to 1.1 Un |
| Consumption (VA or W) | Triggering | 200 (for 200 ms) |
| | Latched | 4.5 |

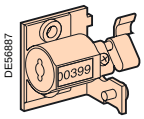
# Description of functions
## Indication




*Rotary type contacts (OC)*




*"Ready to close" PF contact*




*Operation counter (CDM)*

### "Open/closed" auxiliary position contacts (OC)

These auxiliary contacts indicate the "open" or "closed" position of the circuit breaker.

■ Rotary type changeover contacts directly controlled by the circuit breaker mechanism.

■ Indicator contacts are proposed:

□ for standard relaying applications

□ for low level control applications with plc's or electronic circuits.

This version is compatible with Sepam series 20-40-80 units.

| Characteristics | | | |
|---|---|---|---|
| Standard delivery | | | 4 |
| Maximum quantity | | | 11 |
| Breaking capacity (A) | Standard | | Min. load: 100 mA/24 V |
| Cos φ: 0.3 | V AC | 240/380 | 10/6* |
| AC12/DC12 | | 480 | 10/6* |
| | | 690 | 6 |
| | V DC | 24/48 | 10/6* |
| | | 125 | 10/6* |
| | | 250 | 3 |
| | Low level | | Min. load: 2 mA/15 V DC |
| | V AC | 24/48 | 6 |
| | | 240 | 6 |
| | | 380 | 3 |
| | V DC | 24/48 | 6 |
| | | 125 | 6 |
| | | 250 | 3 |

* Standard contacts: 10 A; optional contacts: 6 A (temperature derating)

### "Ready to close" PF contact

The circuit breaker is "ready to close" when shown by a mechanical indicator and a PF contact.

This information simultaneously indicates that:

■ the circuit breaker is open

■ the storage energy springs are armed

■ there is no permanent closing order

■ there is no permanent opening order caused by:

□ a safety opening order (2nd MX or MN)

□ keylocking of the device in the open position.

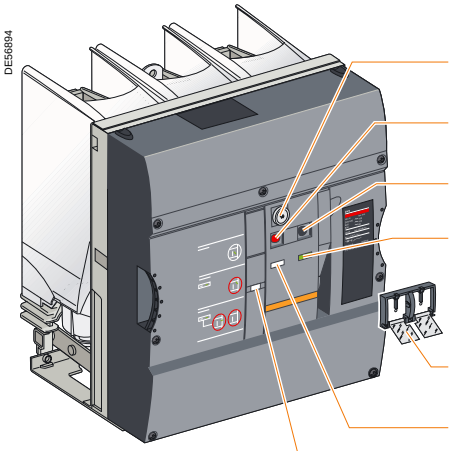
| Characteristics | | | |
|---|---|---|---|
| Standard delivery | | | 0 |
| Maximum quantity | | | 1 |
| Breaking capacity (A) | Standard | | Min. load: 100 mA/24 V |
| Cos φ: 0.3 | V AC | 240/380 | 5 |
| AC12/DC12 | | 480 | 5 |
| | | 690 | 3 |
| | V DC | 24/48 | 3 |
| | | 125 | 0.3 |
| | | 250 | 0.15 |
| | Low level | | Min. load: 2 mA/15 V DC |
| | V AC | 24/48 | 3 |
| | | 240 | 3 |
| | | 380 | 3 |
| | V DC | 24/48 | 3 |
| | | 125 | 0,3 |
| | | 250 | 0,15 |

### Operation counter (CDM)

The operation counter is visible on the front panel.

It totalizes the number of switching cycles (CO) that the device has carried out.

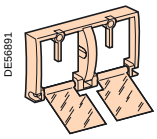
# Description of functions
## Locking/interlocking



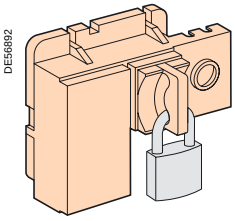

*Locking the circuit breaker in the open position*
*Opening button*
*Closing button*
*Control mechanism status (charged or discharged)*
*Push button locking*
*Circuit breaker position indicator*
*Operation counter*

### Push button locking

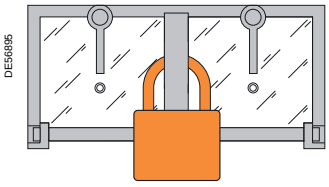
This transparent screen blocks access to the opening and closing push-buttons on the circuit breaker.
The device enables the opening or closing push button to be locked independently. It is often associated with an electrical motor (MCH).
Locking is achieved either:
- by 2 screws
- by 3 padlocks, not supplied
- by a lead seal.



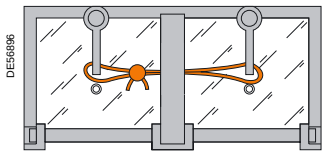

*Push button locking*




*Padlocking of the circuit breaker in the “open” position*




*Padlocking*



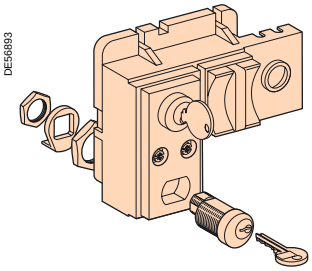

*Lead sealing*

### Locking of the circuit breaker in the “open” position

The circuit breaker is locked in the “open” position by blocking the opening push button in the engaged position:
- by a padlock 1 to 3 padlocks, not supplied
- by a keylocks 1 or 2 different keylocks, not supplied

The keylocks are of captive key type, with the key free after locking, either Profalux or Ronis (right turn), and are proposed according to the options either with:
- 1 single keylock
- 1 single keylock mounted on the circuit breaker + 1 identical delivered separately for interlocking with another device
- 2 different keylocks for double locking.

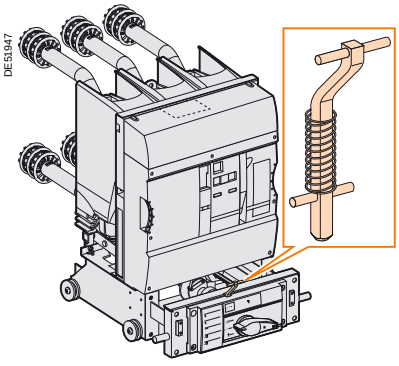
Profalux and Ronis keylocks are inter-compatible.




*Keylocking of the circuit breaker in the “open” position*

### Cubicle door interlocking mechanism

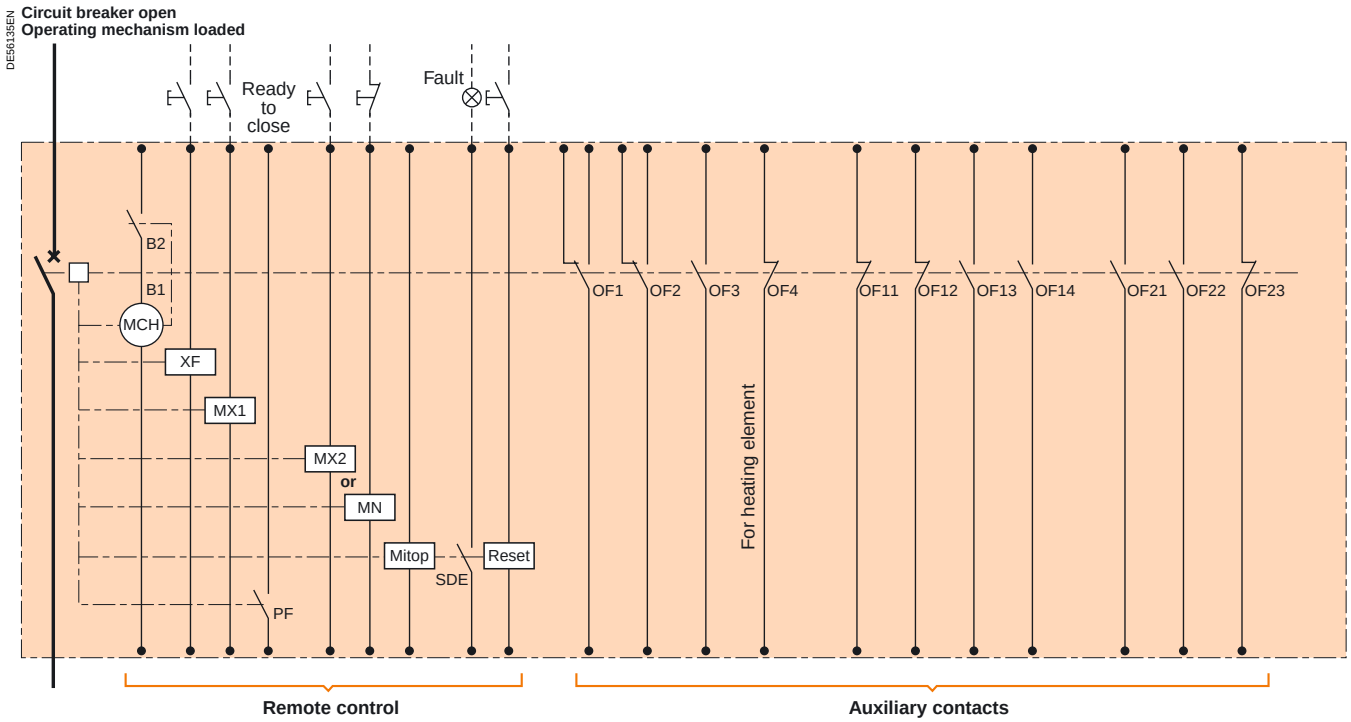
This device enables the circuit breaker to only be operated when the door is closed, for the withdrawable version with a cradle.




*Cubicle door interlocking mechanism*

# Description of functions
## Wiring diagram

### Wiring diagram (principle)



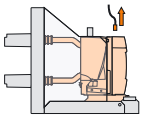
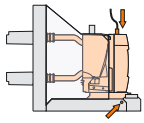
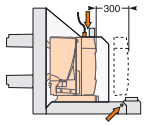

*MCH: electrical motor*
*XF: shunt closing release*
*MX1: shunt opening release*
*MX2: shunt opening release*
***or** MN: undervoltage release*
*Mitop: low energy release*
*SDE: electrical fault signal contact*
*Reset: remote SDE contact reset*
*PF: "ready to close" contact*

# Description of functions
## Safety functions

This table describes the safety functions available on the withdrawable version of the Evolis 17.5 kV circuit breaker.

**How to use the table**
Each of the boxes describes the functional status of each circuit breaker position and the associated parts:

- Possible status
- Possible status, operation impossible
- Impossible status

| Parts | | Circuit breaker positions | | | | | |
|---|---|---|---|---|---|---|---|
| | | | Insertion ⇢ / ⇠ Extraction |  |  | Racking-in ⇢ / ⇠ Racking-out |   |
| | | **Removed** | | **Disconnected** | **Test position** | | **Service** |
| **1 - Cradle** | | | Fool-proof protection (1) | | | | |
| | | | Anti-drop (2) | | | | |
| | | No opening shutters | | | | | |
| | | Shutters padlocking possible | | | | | |
| **2 - LV plug** | Disconnected | | | No racking-in | | | |
| | Connected | | | | No unplugging | | |
| **3 - Circuit breaker** | Closed | | | | No racking-in | | No racking-out |
| | Open | | | | | No closing | |
| | | Open position circuit breaker locking available | | | | | |
| **4 - Switchboard door** | Open | | | | No racking-in | | |
| | Closed | | | | No door opening (3) | | |
| **5 - Earthing switch** | Open | | | | | No earthing switch closing | |
| | Closed | | | | No racking-in | | |

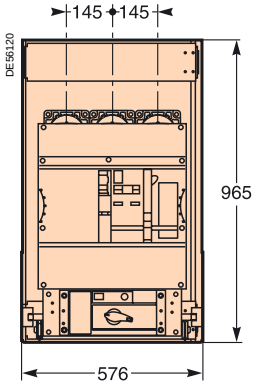
***(1)*** *This protection mechanism ensures that the performance levels of the circuit breaker correspond with those of the cradle.*
***(2)*** *Device that prevents the circuit breaker from dropping when extracted from the cradle.*
*The device can be either unlocked manually or when the extraction rig is put in position.*
***(3)*** *Interlocking device to be fitted to the cubicle door. If there is no interlocking, the circuit breaker device should be inhibited.*

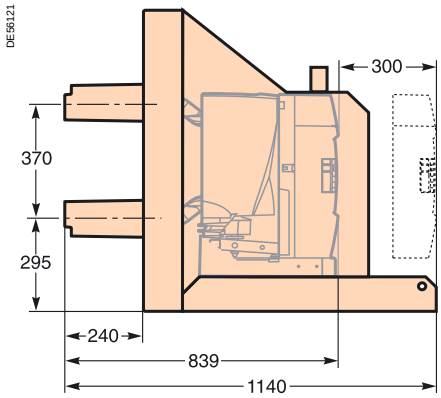
# Dimensions

## Device

### Phase to phase distance 145 mm

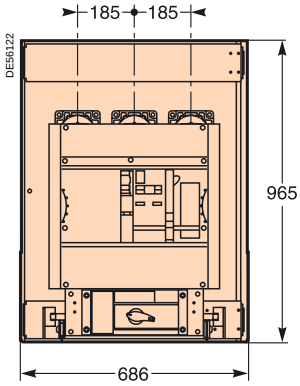
| Ur | Isc | Ir | Weight |
|---|---|---|---|
| 7.2 kV | 25 kA | 630 A | 165 kg |
| | | 1250 A | |
| 12 kV | 25 kA | 630 A | |
| | | 1250 A | |

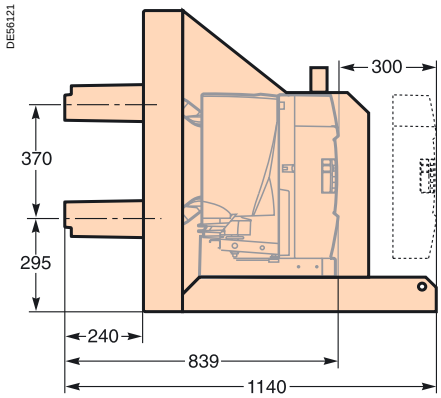



### Phase to phase distance 185 mm

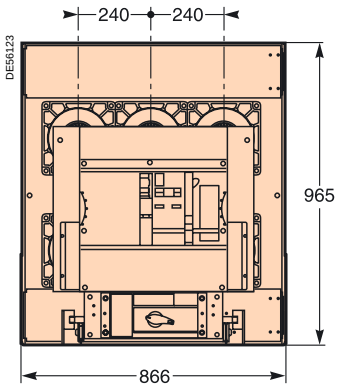
| Ur | Isc | Ir | Weight |
|---|---|---|---|
| 7.2 kV | 25 kA | 630 A | 174 kg |
| | | 1250 A | |
| | 31.5 kA | 630 A | |
| | | 1250 A | |
| 12 kV | 25 kA | 630 A | |
| | | 1250 A | |
| | 31.5 kA | 630 A | |
| | | 1250 A | |
| 17.5 kV | 25 kA | 630 A | |
| | | 1250 A | |
| | 31.5 kA | 630 A | |
| | | 1250 A | |

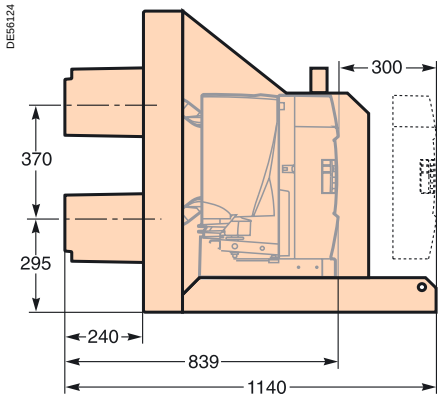



### Phase to phase distance 240 mm

| Ur | Isc | Ir | Weight |
|---|---|---|---|
| 7.2 kV | 25 kA | 2500 A | 272 kg |
| | 31.5 kA | 2500 A | |
| | 40 kA | 630 A | |
| | | 1250 A | |
| | | 2500 A | |
| 12 kV | 25 kA | 2500 A | |
| | 31.5 kA | 2500 A | |
| | 40 kA | 630 A | |
| | | 1250 A | |
| | | 2500 A | |
| 17.5 kV | 25 kA | 2500 A | |
| | 31.5 kA | 2500 A | |
| | 40 kA | 630 A | |
| | | 1250 A | |
| | | 2500 A | |




**Important**
Detailed installation instructions are given in the “Evolis Installation Guide”. Please consult us.

# Offer structure

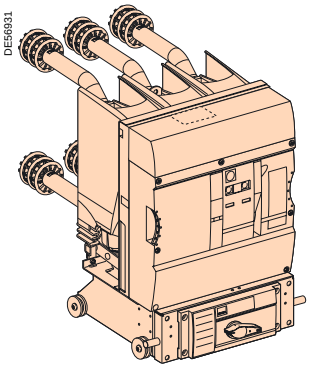
**The basic withdrawable, frontal circuit breaker includes:**
- 6 arms with clusters
- racking truck with operating crank and screw-shaft system
- a manual operating mechanism (spring type)
- LV plug 18 pins
- 1 shunt opening release MX
- 1 block of 4 ON/OFF indication contacts.

**The circuit breaker can receive options.**

**The cradle includes:**
- 6 bushings with fingers
- shutters
- shutters mechanism.

**The cradle can receive accessories.**

## Basic withdrawable, frontal circuit breaker




| Phase distance (mm) | | | 145 | 185 | 240 |
|---|---|---|---|---|---|
| **7.2 kV** | 25 kA | 630 A | ■ | ■ | |
| | | 1250 A | ■ | ■ | |
| | | 2500 A | | | ■ |
| | 31.5 kA | 630 A | | ■ | |
| | | 1250 A | | ■ | |
| | | 2500 A | | | ■ |
| | 40 kA | 630 A | | | ■ |
| | | 1250 A | | | ■ |
| | | 2500 A | | | ■ |
| **12 kV** | 25 kA | 630 A | ■ | ■ | |
| | | 1250 A | ■ | ■ | |
| | | 2500 A | | | ■ |
| | 31.5 kA | 630 A | | ■ | |
| | | 1250 A | | ■ | |
| | | 2500 A | | | ■ |
| | 40 kA | 630 A | | | ■ |
| | | 1250 A | | | ■ |
| | | 2500 A | | | ■ |
| **17.5 kV** | 25 kA | 630 A | | ■ | |
| | | 1250 A | | ■ | |
| | | 2500 A | | | ■ |
| | 31.5 kA | 630 A | | ■ | |
| | | 1250 A | | ■ | |
| | | 2500 A | | | ■ |
| | 40 kA | 630 A | | | ■ |
| | | 1250 A | | | ■ |
| | | 2500 A | | | ■ |

# Offer structure (cont.)

## Circuit breaker options

### Remote control (see possible choices in combination table below)

DE56933

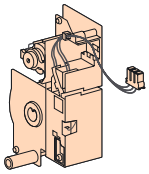



*Fig. 1*

DE56934

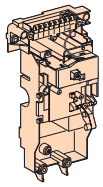



*Fig. 2*

DE56879

*Fig. 3*

DE56881

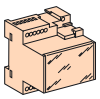



*Fig. 4*

DE56887

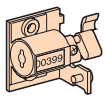



*Fig. 5*

**2nd opening release**

Shunt opening release **MX** *(fig. 3)*

Undervoltage release **MN** (*fig. 3)*

Time delay unit for **MN** (setting 0.5, 0.9, 1.5, 3 s) *(fig. 4)*

Low energy release **Mitop** *(fig. 2)*
1 AC fault signalling SDE and reset 200…250 Vac are included

**Remote control including:**

Electrical motor **MCH** and shunt closing release **XF**
and operation counter **CDM** *(fig. 1, 3 & 5)*

*Releases combinations table*

| | | | | | | |
|---|---|---|---|---|---|---|
| MX | 1 | 2 | 1 | 1 | 2 | 1 |
| MN | | | 1 | | | 1 |
| Mitop | | | | 1 | 1 | 1 |

### Indication

DE56887

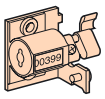



*Fig. 1*

DE56885

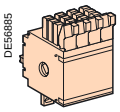



*Fig. 2*

DE56886

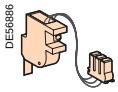



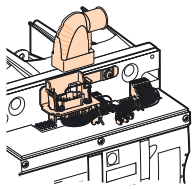
*Fig. 3*

Operation counter **CDM** *(fig. 1)*

Additional auxiliary contacts **OF** (4 AC) *(fig. 2)*

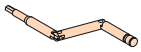
Ready to close contact **PF** (1 AC) *(fig. 3)*

### LV wiring connection

DE51944


42-pin LV plug (instead of 18 pins)

### Rack-in/rack-out operation

DE56915


Operating crank

### Locking/interlocking

DE56935

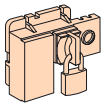



*Fig. 1*

DE56936

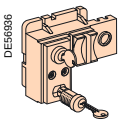



*Fig. 2*

DE56891

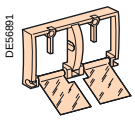



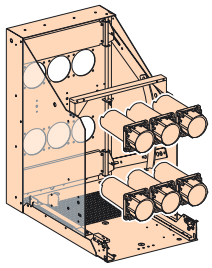
*Fig. 3*

Locking of the circuit breaker in the open position by padlock (padlock supplied by customer) *(fig. 1)*

Locking of the circuit breaker in the open position by key locks *(fig. 2)* — 1 lock / 2 locks

Disabling of O/C circuit breaker buttons (padlock supplied by customer) *(fig. 3)*

## Cradle

DE56937


Cradle with 145 mm phase distance

Cradle with 185 mm phase distance

Cradle with 240 mm phase distance

## Cradle accessories

DE51950

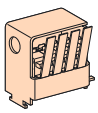



*Fig. 1*

DE56938

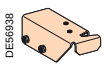



*Fig. 2*

Racked in/out position contacts (4 AC) *(fig. 1)*

C.B. “ready to be operated” **PAF** (1 AC) *(fig.2)*
indicates that the C.B. is locked in place in the cradle

DE56939

6 field deflectors for bushings
**mandatory** if Ur = 17.5 kV - 95 kVpeak with phase distance 185 mm

# Order form

Only one of the boxes (ticked [X] or filled [ ] by the needed value) have to be considered between each horizontal line.
Orange box [X] corresponds to none priced functions.

## Basic withdrawable, frontal circuit breaker

Quantity [ ]

**Rated voltage Ur** (kV) [ ]

**Rated short-circuit breaking current Isc** (kA) [ ]

**Rated normal current Ir** (A) [ ]

**Phase distance (mm)** **145** [ ] **185** [ ] **240** [ ]

**Colour for push buttons and indicators** IEC standard [ ] ANSI standard [ ]

## Circuit breaker options

### 1st opening release (see possible choices in combination table below)

Shunt opening release - **MX**

| | | |
|---|---|---|
| 24 Vac [ ] | 24…30 Vdc [ ] | 100…130 Vdc/ac [ ] |
| 48 Vac [ ] | 48…60 Vdc [ ] | 200…250 Vdc/ac [ ] |

### 2nd opening release (a 42-pin LV plug is mandatory)

Shunt opening release - **MX**

| | | |
|---|---|---|
| 24 Vac [ ] | 24…30 Vdc [ ] | 100…130 Vdc/ac [ ] |
| 48 Vac [ ] | 48…60 Vdc [ ] | 200…250 Vdc/ac [ ] |

Undervoltage release - **MN**

| | | |
|---|---|---|
| 24 Vac [ ] | 24…30 Vdc [ ] | 100…130 Vdc/ac [ ] |
| 48 Vac [ ] | 48…60 Vdc [ ] | 200…250 Vdc/ac [ ] |

Time delay unit for **MN**

| | | |
|---|---|---|
| 48…60 Vdc/ac [ ] | 100…130 Vdc/ac [ ] | 200…250 Vdc/ca [ ] |

Low energy release **Mitop**
1 AC fault signalling SDE and reset 200...250 Vac are included [ ]

### Remote control (operation counter already included)

Electrical motor - **MCH**

| | | |
|---|---|---|
| 24…30 Vdc [ ] | 100…125 Vdc [ ] | 200…250 Vdc [ ] |
| 48…60 Vdc/ac [ ] | 100…130 Vac [ ] | 200…240 Vac [ ] |

Shunt closing release - **XF**

| | | |
|---|---|---|
| 24 Vac [ ] | 24…30 Vdc [ ] | 100…130 Vdc/ac [ ] |
| 48 Vac [ ] | 48…60 Vdc [ ] | 200…250 Vdc/ac [ ] |

**Operation counter CDM** (already included if remote control supplied) [ ]

**Additional auxiliary contacts OF** (4 AC) 1 [ ] 2 [ ]

**Ready to close contact PF** (1 AC) [ ]

**LV plug** 42-pin LV plug (instead of 18) [ ]

**Operating crank** Quantity (one mini per switchboard) [ ]

**Locking of the circuit breaker in the open position**

By padlock [ ]

or by locks and keys Profalux [ ] Ronis [ ]

If locks 1 lock [ ] 2 identical locks [ ] 2 different locks [ ]

**Disabling of O/C circuit breaker push buttons** [ ]

## Cradle

Quantity [ ]

**Phase distance (mm)** **145** [ ] **185** [ ] **240** [ ]

### Cradle accessories

**Racked in/out C.B. position signalling** (4 AC) [ ]

**C.B. "ready to be operated" PAF** (1 AC) [ ]

**Field deflectors for bushings** [ ]

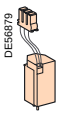
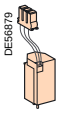
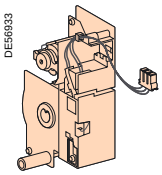
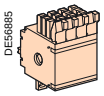
*Releases combinations table*

| | | | | | | |
|---|---|---|---|---|---|---|
| Shunt opening MX | 1 | 2 | 1 | 1 | 2 | 1 |
| Undervoltage MN | | | 1 | | | 1 |
| Mitop | | | | 1 | 1 | 1 |

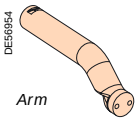
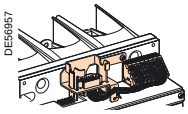
# Offer structure
## Separated components

*The following components can be ordered separately and can be adapted or replaced by the customer.*

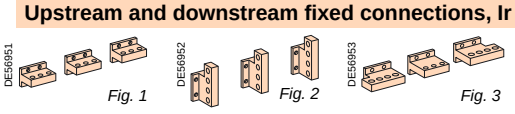
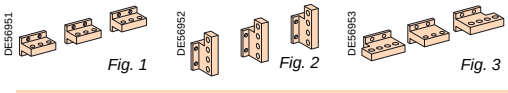
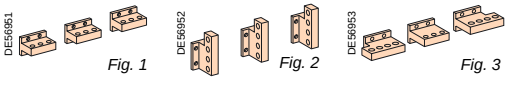
### Remote control

| | | Ref. |
|---|---|---|
| **MX1, MX2, XF shunt opening/closing release** | | |
|  DE56879 | 24…30 Vdc / 24 V 50/60 Hz | **59141** |
| | 48…60 Vdc / 48 V 50/60 Hz | **59142** |
| | 100…130 Vac - 50/60 Hz | **59143** |
| | 200…250 Vac - 50/60 Hz | **59144** |
| **MN undervoltage release** | | |
|  DE56879 | 24…30 Vdc / 24 V 50/60 Hz | **33668** |
| | 48…60 Vdc / 48 V 50/60 Hz | **33669** |
| | 100…130 Vac - 50/60 Hz | **33670** |
| | 200…250 Vac - 50/60 Hz | **33671** |
| **MCH electrical motor** | | |
|  DE56933 | 24…30 Vdc | **47888** |
| | 48…60 Vdc | **47889** |
| | 100…125 Vdc | **47890** |
| | 200…250 Vdc | **47891** |
| | 48…60 Vac - 50/60 Hz | **47889** |
| | 100…130 Vac - 50/60 Hz | **47893** |
| | 200…240 Vac - 50/60 Hz | **47894** |
| **Additional auxiliary contacts** | | |
|  DE56885 | 4 AC | **47887** |

### MV and LV connection accessories

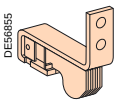
| | | Ref. |
|---|---|---|
| **MV connection accessories** | | |
|  DE56954 *Arm* DE56955 *Cluster* DE56956 *Finger* | 3 clusters + 3 fingers / 630-1250 A | **59369** |
| | 3 clusters + 3 fingers / 630-2500 A | **59371** |
| | 3 arms / 630-1250 A | **59396** |
| | 3 arms / 630-2500 A | **59397** |
| **LV plug** | | |
|  DE56957 | Standard (18 pins) | **59114** |
| | All options (42 pins) | **59115** |
| **LV terminal blocks** | | |
| DE56958 | 1 terminal block | **47074** |
| **LV wiring** | | |
| | 21 marked LV wires fitted in socket type pins | **59117** |

### Other circuit breaker accessories

| | | Ref. |
|---|---|---|
| **Upstream and downstream fixed connections, Ir** (to be mounted on basic circuit breaker or bushings) | | |
|  DE56951 *Fig. 1* DE56952 *Fig. 2* DE56953 *Fig. 3* | 3 fixed distance H or V *(fig. 1)* / 630-1250 A | **59400** |
| | 3 variable distance H *(fig. 3)* / 630-1250 A | **59401** |
| | 3 variable distance V *(fig. 2)* / 630-1250 A | **59402** |
| **Upstream fixed connections, Ir** (to be mounted on basic circuit breaker or bushings) **or downstream fixed connections, Ir** (to be mounted on bushings only) | | |
|  DE56951 *Fig. 1* DE56952 *Fig. 2* DE56953 *Fig. 3* | 3 fixed distance H or V *(fig. 1)* / 630-2500 A | **59403** |
| | 3 variable distance H *(fig. 3)* / 630-2500 A | **59404** |
| | 3 variable distance V *(fig. 2)* / 630-2500 A | **59405** |
| **Downstream fixed connections, Ir** (to be mounted on basic circuit breaker only) | | |
|  DE56951 *Fig. 1* DE56952 *Fig. 2* DE56953 *Fig. 3* | 3 fixed distance H or V *(fig. 1)* / 630-2500 A | **59409** |
| | 3 variable distance H *(fig. 3)* / 630-2500 A | **59410** |
| | 3 variable distance V *(fig. 2)* / 630-2500 A | **59411** |

# Offer structure
## Separated components (cont.)

### Earthing device


DE56855

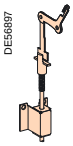
| | |
|---|---|
| Earthing sliding contact on C.B. | **59456** |

### Labels kit for push button and indicator (O/C)

DE56898

| | |
|---|---|
| Circuit breaker specific labels green, red, etc. | **59100** |

### Circuit breaker opening external device

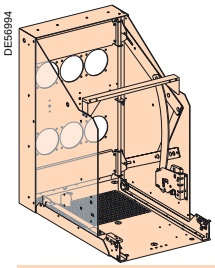

DE56897

| | |
|---|---|
| Adaptation kit needed for circuit breaker opening (for retrofit) | **59093** |

## Cradle

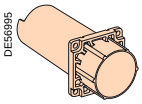
| | Ref. |
|---|---|

### Cradle without bushings


DE56994

| | |
|---|---|
| Phase distance 145 mm | **59316** |
| Phase distance 185 mm | **59317** |
| Phase distance 240 mm | **59318** |

### Bushings


DE56995

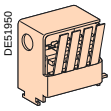
| | |
|---|---|
| 1 full bushing 630-1250 A | **59382** |
| 1 full bushing 630-2500 A | **59383** |
| (you need at least 6 bushings per cradle) | |

### Field deflectors for bushings

DE56939

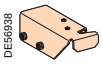
| | |
|---|---|
| 6 deflectors used to increase dielectric withstand from 75 to 95 kV | **59283** |

### Racked in/out position signalling


DE51950

| | |
|---|---|
| 4 AC | **59173** |

### Ready to be operated signalling


DE56938

| | |
|---|---|
| C.B. “ready to be operated” PAF (1 AC) indicates that the C.B. is locked in place in the cradle | **59174** |

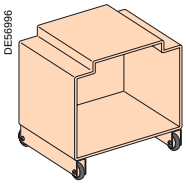
### Racking base

| | |
|---|---|
| 2 rails | **59299** |

## Various

| | Ref. |
|---|---|

### Circuit breaker support frame


DE56996

| | |
|---|---|
| Drawings and casters | **59050** |

### Technical documentation

DE56997

| | |
|---|---|
| User manual | **59069** |

# Services

**The following components can only be adapted or replaced on site by staff trained by Schneider Electric:**

- remote control mechanism (comprising: electrical motor, shunt closing release, operation counter)
- operation counter
- low energy release (Mitop)
- interlocking between the “open” circuit breaker position and the LV plug
- racking truck
- circuit breaker front cover.

# Evolis 24 kV
# fixed, frontal version

*Panorama* *11*
*Evolis 17.5 kV fixed, frontal version* *15*
*Evolis 17.5 kV withdrawable, frontal version* *33*

**Main characteristics** **54**

**Description of functions** **55**
MV connection 55
LV connection 56
Opening circuit 57
Remote control 58
Indication and locking/interlocking 59
Wiring diagram 60

**Dimensions** **61**

**Offer structure** **62**

**Order form** **63**

**Separated components** **64**

**Services** **66**

*Evolis 24 kV withdrawable, frontal version* *67*
*Evolis and EVOset 24 kV fixed, lateral version* *87*
*Evolis Pilot monitoring device* *109*

# Main characteristics

PE55692

## Electrical characteristics according to IEC 62271-100

| Ur 24 kV | Isc | Ir | | |
|---|---|---|---|---|
| **Phase to phase distance (mm)** | | | **230** | **250** |
| Ud 50 kV 50 Hz, 1 min | 16 kA | 630 A | ■ | ■ |
| Up 125 kV peak | | 1250 A | ■ | ■ |
| | | 2000 A | | ■ |
| | | 2500 A | | ■ |
| | 25 kA | 630 A | ■ | ■ |
| | | 1250 A | ■ | ■ |
| | | 2000 A | | ■ |
| | | 2500 A | | ■ |
| | 31.5 kA | 630 A | | ■ |
| | | 1250 A | | ■ |
| | | 2000 A | | ■ |
| | | 2500 A | | ■ |

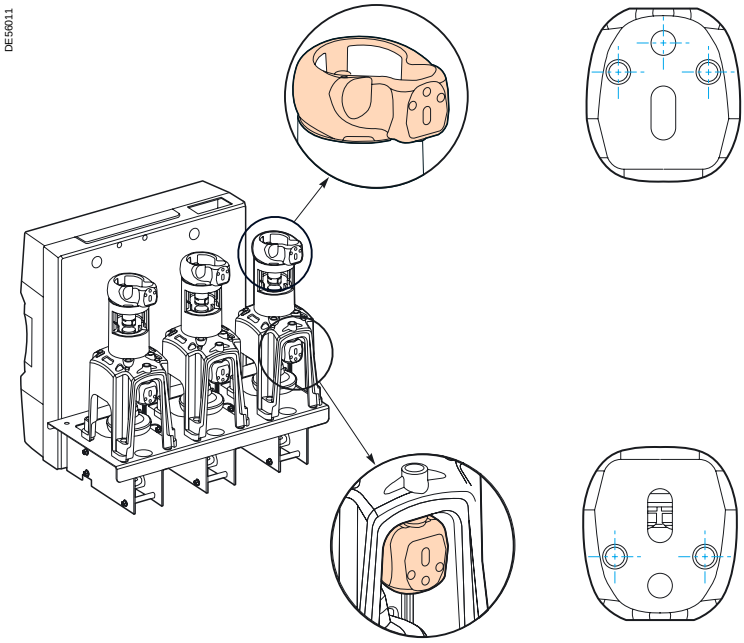
## Additional characteristics according to IEC 62271-100

| **Rated values** | | | |
|---|---|---|---|
| Voltage | **Ur** | kV rms | 24 |
| Insulation voltage: | | | |
| - power frequency withstand | **Ud** | kV rms | 50 |
| - lightning impulse withstand (1.2/50 µs) | **Up** | kV peak | 125 |
| Frequency | **fr** | Hz | 50-60 |
| Short time withstand current | **Ik/tk** | kA | Isc/3 s |
| Peak withstand current | **Ip** | kA peak | 2.5 Isc (50 Hz) |
| | | | 2.6 Isc (60 Hz) |
| Short circuit making capacity | | kA peak | 2.5 Isc (50 Hz) |
| | | | 2.6 Isc (60 Hz) |
| **Other characteristics** | | | |
| Operating sequence | | | O-0.3 s-CO-15 s-CO |
| | | | O-0.3 s-CO-3 min-CO |
| | | | O-3 min-CO-3 min-CO |
| Operating times | Opening | ms | < 50 |
| | Breaking | ms | < 65 |
| | Closing | ms | < 70 |
| Mechanical endurance | Class | | M2 |
| | Number of switching operations | | 10000 (30000 on request) |
| Electrical endurance | Class | | E2 |
| Number of switching operations at full Isc value | 16 kA | | 100 |
| | 25 kA | | 100 |
| | 31.5 kA | | 100 |
| Capacitive current breaking capacity | Class | | C1-C2 (for certain applications) |
| Operating conditions | | | –25°C to +40°C |
| Average relative humidity | Over 24 h | | < 95% |
| | Over 1 month | | < 90% |

# Description of functions
## MV connection

### Composition
The basic circuit breaker is equipped with nickel plated aluminium connector terminals with drilled holes.

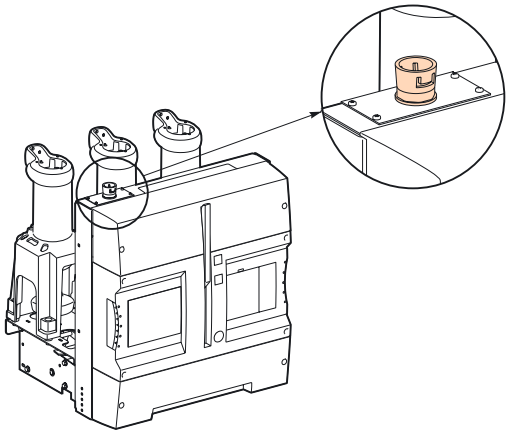
### Connection
The customer connection is carried out easily from outside the circuit breaker on these vertical connection terminals.




Connection configurations that have undergone type testing are shown in the Installation Guide.

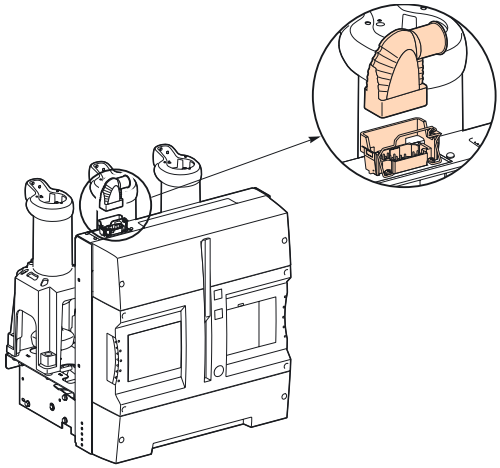
# Description of functions
## LV connection

DE51951



*LV connection without plug*

DE51952



*LV connection with plug*

### Two connection solutions

**Directly on the LV terminal block**
The circuit breaker's LV wiring can be directly connected to the LV terminal block of the operating mechanism through a cable protection duct.

**With LV plug**
- The fixed part (male) mounted on the circuit breaker and fully connected to the operating mechanism
- The mobile part (female) compatible with the male part.

### Two versions of the LV plug are available

**An 21-pin version, enabling connection of:**
- a shunt opening release YO1
- an electrical remote control mechanism (electrical motor, shunt closing release XF, anti-pumping relay)
- the "Pilot" monitoring device
- a maximum number of auxiliary contacts: 3 NC - 3 NO - 1 changeover contact.

*(see "indication and locking/interlocking" page, "Open/closed position auxiliary contacts" chapter).*

***Note:** see the table of the releases' combinations "Order form" page.*

**An 42-pin version, enabling connection of:**
- an opening release (shunt type YO1 or undervoltage type YM)
- a second opening release (shunt type YO2 or undervoltage type YM or Mitop low energy release)
- an electrical remote control mechanism (electrical motor, shunt closing release YF, anti-pumping relay)
- the "Pilot" monitoring device
- a maximum number of auxiliary contacts: 5 NC - 6 NO - 1 changeover contact.

*(see "indication and locking/interlocking" page, "Open/closed position auxiliary contacts" chapter).*

***Note:** see the table of the releases' combinations "Order form" page.*

### LV wiring kit
A wiring kit with 21 or 42 wires (2 meters long) equipped with pins that can be adapted to the LV plug can be supplied for connected in to the cubicle's LV compartment.

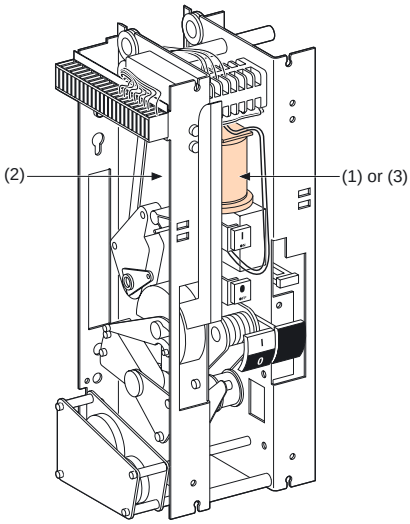
### Flexible ducting
This 525 mm long duct with a hinged LV plug, enables protection of the LV wiring that connects the circuit breaker to the cubicle's LV compartment.

### Interlocking kit
For circuit breakers intended for withdrawable applications, an interlocking kit can be adapted. The kit enables the mechanical position status to be given ("connected/disconnected") of the LV plug. By adding a link between this mechanical data (by the customer) and the open/closed position of the circuit breaker, interlocking can be achieved between the LV plug and the open/closed position of the circuit breaker (required by IEC standard 62271-200).

A detailed explanation of operation is given in the Installation Guide.

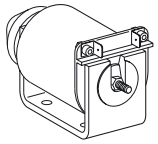
# Description of functions
## Opening circuit

DE56114EN



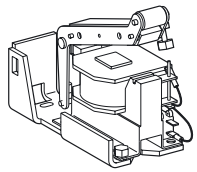

*Operating mechanism*

DE60094



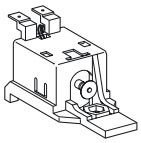
*Shunt opening release (1)*

DE60089



*Undervoltage release (2)*

DE60091



*Low energy release (3)*

### Composition

The opening circuit is produced using the following components:
- shunt opening release (Y01)
- second shunt opening release (YO2)
- undervoltage release (YM)
- low energy release (Mitop).

***Note:*** *see the table of the releases' combinations "Order form" page.*

### Shunt opening release (YO1 and YO2)

Energizing this release causes instant opening of the circuit breaker.

| Characteristics | | | |
|---|---|---|---|
| Power supply | | See "Order form" page | |
| Threshold | | V AC | 0.85 to 1.1 Un |
| | | V DC | 0.7 to 1.1 Un |
| Consumption | | V AC | 160 VA |
| | | V DC | 50 W |

### Undervoltage release (YM)

This release unit causes the systematic opening of the circuit breaker when its supply voltage drops below a value less than 35% of the rated voltage, even if this drop is slow and gradual. It can open the circuit breaker between 35% and 70% of its rated voltage. If the release unit is not supplied power, manual or electrical closing of the circuit breaker is impossible. Closing of the circuit breaker is possible when the supply voltage of the release unit reaches 85% of its rated voltage.

| Characteristics | | | |
|---|---|---|---|
| Power supply | | See "Order form" page | |
| Threshold | | Opening | 0.35 to 0.7 Un |
| | | Closing | 0.85 Un |
| Consumption | Triggering | V AC | 400 VA |
| | | V DC | 100 W |
| | Latched | V AC | 100 VA |
| | | V DC | 10 W |

### Low energy release (Mitop)

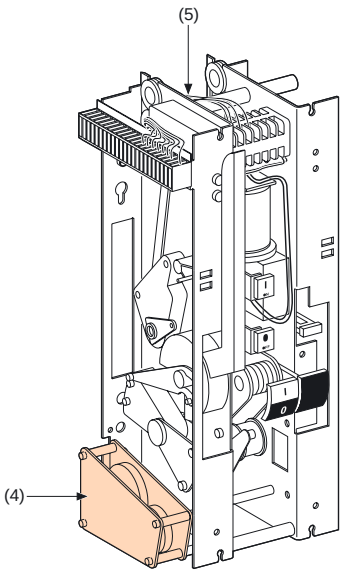
This release includes a low consumption unit and is specifically used with the Sepam 100LA self-powered relay ("REFLEX MODULE"), or the VIP relay.

| Characteristics | |
|---|---|
| Power supply | Direct current |
| Threshold | 0.6 A < I < 3 A |

Any tripping due to the Mitop release unit is momentarily indicated by an SDE type changeover contact (option).

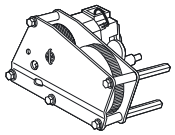
# Description of functions
## Remote control

DE56115



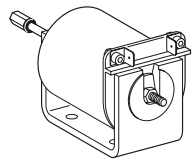

*Operating mechanism*

DE60093



*Electrical motor and gearing (4)*

DE60151



*Shunt closing release (5)*

### Function
Remote control enables the remote opening and closing of the circuit breaker.

### Composition
The remote control mechanism comprises:
- an electrical motor with gearing
- a shunt closing release (YF) combined with an anti-pumping device
- an operation counter.

### Electrical motor with gearing
The electrical motor carries out the automatic rearming of the stored energy unit as soon as the circuit breaker is closed. This allows the instant reclosing of the device after opening. The arming lever is only used as a backup operating mechanism in the case of the absence of the auxiliary power supply.
The M3 contact indicates the end of arming operations.

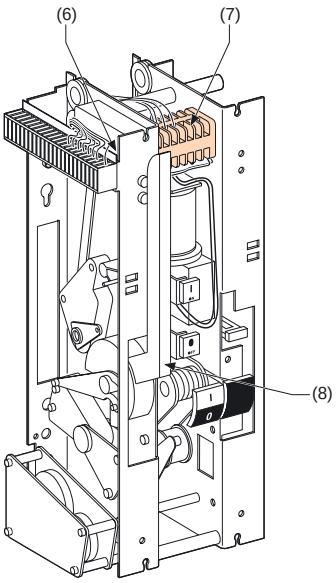
| Characteristics | | |
|---|---|---|
| Power supply | See “Order form” page | |
| Threshold | V AC/V DC | 0.85 to 1.1 Un |
| Consumption | V AC | 380 VA |
| | V DC | 380 W |

### Shunt closing release (YF)
This release allows the remote closing of the circuit breaker when the operating mechanism is armed.

| Characteristics | | |
|---|---|---|
| Power supply | See “Order form” page | |
| Threshold | V AC | 0.85 to 1.1 Un |
| | V DC | 0.85 to 1.1 Un |
| Consumption | V AC | 160 VA |
| | V DC | 50 W |

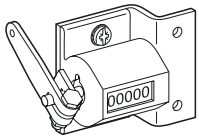
The shunt closing release is combined with an anti-pumping relay that enables priority to be given to opening in the case of a permanent closing order. This thus avoids the device being caught in an uncontrolled opening-closing cycle.

DE56116



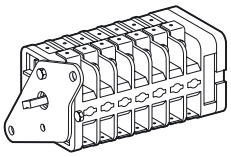

*Operating mechanism*

DE60087



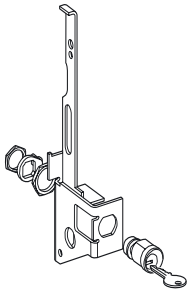
*Operation counter (6)*

DE53953



*Auxiliary contacts (7)*

DE60124



*Kit to lock the circuit breaker in the “open” position (8)*

## Operation counter

The operation counter is visible on the front panel.
It displays the number of switching cycles (CO) that the device has carried out.

## “Open/closed” auxiliary contacts (OC)

These auxiliary contacts indicate the “open” or “closed” position of the circuit breaker. The number of contacts available depends on the options chosen on the operating mechanism.

■ In the basic configuration, the circuit breaker operating mechanism comprises a total of:
□ 5 normally closed contacts (NC)
□ 6 normally open contacts (NO)
□ 1 changeover contact (CHG).

The usage mode for auxiliary contacts is given in the following table:

| **Options** | | |
|---|---|---|
| | **NC contact** | **NO contact** |
| Remote control | 1 | 1 |
| Shunt opening release (each one) | 0 | 1 |
| Undervoltage release | 0 | 0 |
| Low energy release (Mitop) | 0 | 0 |
| Trip circuit supervision | 1 | 0 |

To know the final number of available contacts, you must deduct the total number of contacts included in the circuit breaker (5 NC + 6 NO + 1 CHG) from the number of contacts used indicated in the table below.
**E.g.:** a circuit breaker equipped with a remote control and a shunt release has the following contacts available:
4 NC + 4 NO + 1 CHG.
With an undervoltage release instead of a shunt release, this circuit breaker would have the following available contacts:
4 NC + 5 NO + 1 CHG.

■ Using a 21-pin LV plug (for withdrawable applications) the maximum number of available contacts is:
□ 3 NC
□ 3 NO
□ 1 changeover.
*(Instead of 5 NC-6 NO-1 CHG with a 42-pin socket).*

| **Contact characteristics** | | | |
|---|---|---|---|
| Rated current | | | 10 A |
| Breaking capacity | AC | 220 V (cos φ ≥ 0.3) | 1 A |
| | DC | 110/220 V (L/R ≤ 0.02 s) | 0.3 A |

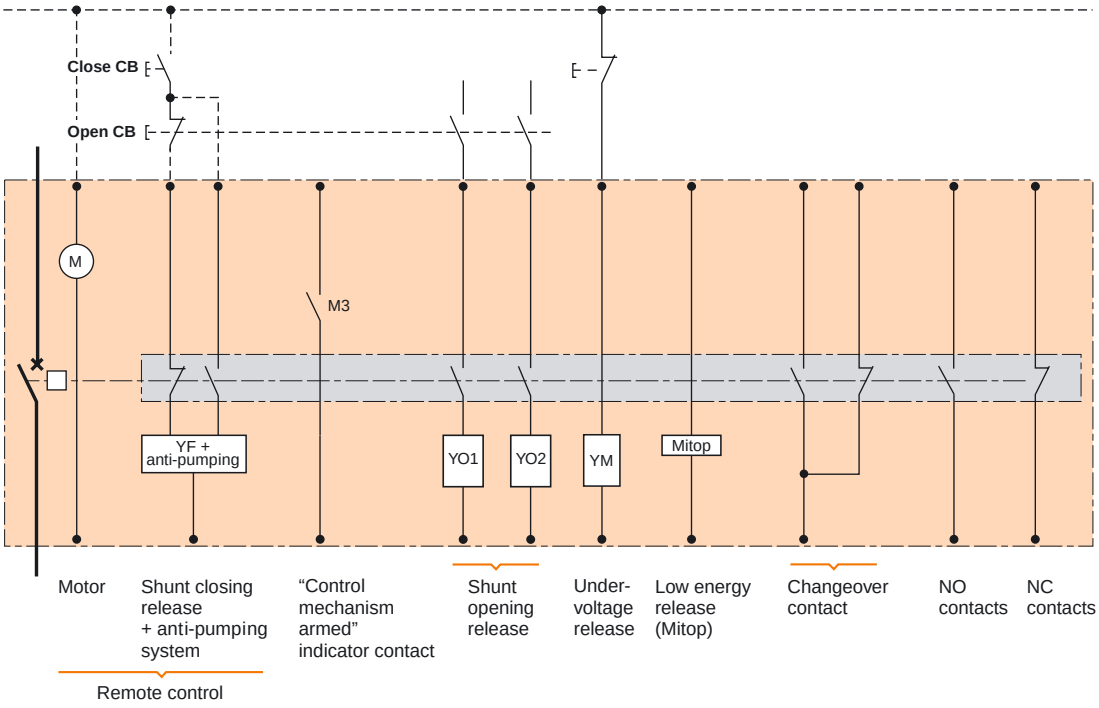
## Locking of the circuit breaker in the “open” position

This locking system enables the fitting of a Profalux or Ronis captive key type keylock (right turn type keylock).
The keylock is not part of the kit but can be supplied as an option.

# Description of functions
## Wiring diagram

DE56117EN

### Wiring diagram (principle)

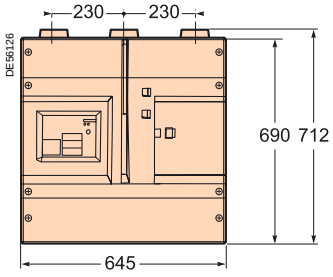


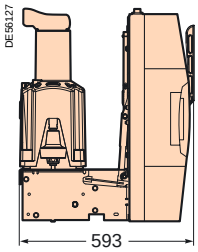
# Dimensions

## Device

### Phase to phase distance 230 mm

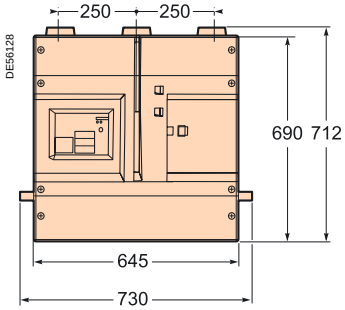
| Ur | Isc | Ir | Weight |
|---|---|---|---|
| 24 kV | 16 kA | 630 A | 97 kg |
| | | 1250 A | |
| | 25 kA | 630 A | |
| | | 1250 A | |

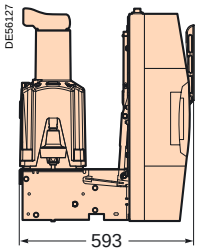


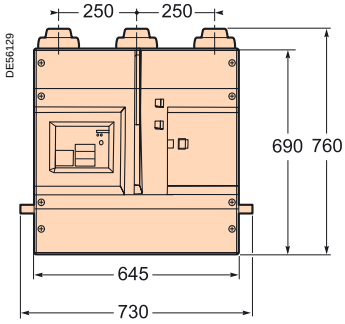

### Phase to phase distance 250 mm

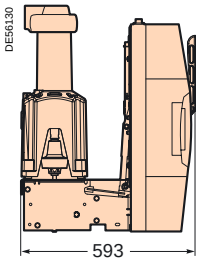
| Ur | Isc | Ir | Weight |
|---|---|---|---|
| 24 kV | 16 kA | 630 A | 97 kg |
| | | 1250 A | |
| | 25 kA | 630 A | |
| | | 1250 A | |




| Ur | Isc | Ir | Weight |
|---|---|---|---|
| 24 kV | 16 kA | 2000 A | 135 kg |
| | | 2500 A | |
| | 25 kA | 2000 A | |
| | | 2500 A | |
| | 31.5 kA | 630 A | |
| | | 1250 A | |
| | | 2000 A | |
| | | 2500 A | |




**Important**
Detailed installation instructions are given in the “Evolis Installation Guide”. Please consult us.

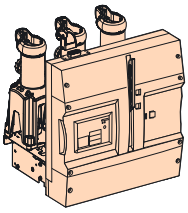
# Offer structure

**The basic fixed, frontal circuit breaker includes:**
- a manual operating mechanism (spring type)
- 1 shunt opening release YO1
- 1 block of auxiliary contacts.

**The circuit breaker can receive options.**

## Basic fixed, frontal circuit breaker

DE56031



| Phase distance (mm) | | | 230 | 250 |
|---|---|---|---|---|
| **24 kV -** 125 kV peak | 16 kA | 630 A | ■ | ■ |
| | | 1250 A | ■ | ■ |
| | | 2000 A | | ■ |
| | | 2500 A | | ■ |
| | 25 kA | 630 A | ■ | ■ |
| | | 1250 A | ■ | ■ |
| | | 2000 A | | ■ |
| | | 2500 A | | ■ |
| | 31.5 kA | 630 A | | ■ |
| | | 1250 A | | ■ |
| | | 2000 A | | ■ |
| | | 2500 A | | ■ |

## Circuit breaker options

**Remote control** (see possible choices in combination table below)

DE56037

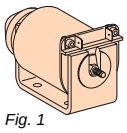


*Fig. 1*

DE56033

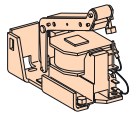


*Fig. 2*

DE56038

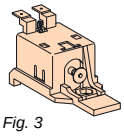


*Fig. 3*

**1st opening release**

Possibility of replacing YO1 by undervoltage release - **YM** *(fig. 2)*

**2nd opening releasee**

Shunt opening release - **YO2** *(fig. 1)*

Undervoltage release - **YM** *(fig. 2)*

Low energy release **Mitop** *(fig. 3)*

**Remote control including:**

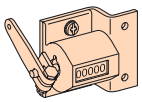
Electrical motor, gear reducer, shunt closing release, anti-pumping relay, operation counter

*Releases combinations table*

| | No LV plug or 42-pin LV plug | | | | | | 21-pin LV plug | |
|---|---|---|---|---|---|---|---|---|
| Shunt opening YO1 | 1 | | 1 | 1 | 1 | | 1 | |
| Shunt opening YO2 | | | 1 | | | | | |
| Undervoltage release YM | | 1 | | 1 | | 1 | | |
| Mitop | | | | | 1 | 1 | | |

## Indication

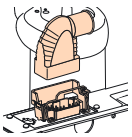
DE56040



Operation counter (already included if remote control supplied)

## LV wiring connection

DE51954

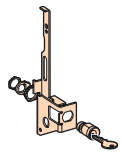


21-pin LV plug

42-pin LV plug

## Locking, interlocking

DE56039



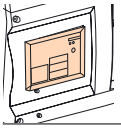
Open position circuit breaker locking (without lock)

Ronis lock

Profalux lock

## Monitoring device

DE56035



Pilot module (with connecting kit)

Diagnosis by Schneider Electric expert

# Order form

Only one of the boxes (ticked [X] or filled [ ] by the needed value) have to be considered between each horizontal line.
Orange box [X] corresponds to none priced functions.

## Basic fixed, frontal circuit breaker

Quantity [ ]

| | | |
|---|---|---|
| **Rated voltage Ur** | | **(kV)** 24 |
| **Rated short-circuit breaking current Isc** | | **(kA)** [ ] |
| **Rated normal current Ir** | | **(A)** [ ] |
| **Phase distance (mm)** | **230** [ ] | **250** [ ] |
| **Colour for push buttons and indicators** | **IEC standard** | **ANSI standard** |
| Push buttons open/closed: | red/black [ ] | |
| Indicator open/closed: | black/white [ ] | green/red [ ] |
| Operating mechanism charged/discharged: | white/yellow [ ] | charge/discharge [ ] |

## Circuit breaker options

### 1st opening release (see possible choices in combination table below)

Shunt opening release - **YO1**

| | | |
|---|---|---|
| 24 Vdc [ ] | 110 Vdc [ ] | 110 Vac (50 Hz) [ ] |
| 48 Vdc [ ] | 125-127 Vdc [ ] | 220-230 Vac (50 Hz) [ ] |
| | 220 Vdc [ ] | 120 Vac (60 Hz) [ ] |

Undervoltage release - **YM**

| | | |
|---|---|---|
| 24 Vdc [ ] | 110 Vdc [ ] | 110 Vac (50 Hz) [ ] |
| 48 Vdc [ ] | 125-127 Vdc [ ] | 220-230 Vac (50 Hz) [ ] |
| | 220 Vdc [ ] | 120 Vac (60 Hz) [ ] |

### 2nd opening release (see possible choices in combination table below)

Shunt opening release - **YO2**

| | | |
|---|---|---|
| 24 Vdc [ ] | 110 Vdc [ ] | 110 Vac (50 Hz) [ ] |
| 48 Vdc [ ] | 125-127 Vdc [ ] | 220-230 Vac (50 Hz) [ ] |
| | 220 Vdc [ ] | 120 Vac (60 Hz) [ ] |

Undervoltage release - **YM**

| | | |
|---|---|---|
| 24 Vdc [ ] | 110 Vdc [ ] | 110 Vac (50 Hz) [ ] |
| 48 Vdc [ ] | 125-127 Vdc [ ] | 220-230 Vac (50 Hz) [ ] |
| | 220 Vdc [ ] | 120 Vac (60 Hz) [ ] |

Low energy release **Mitop** [ ]

### Remote control (operation counter already included)

Electrical motor

| | | |
|---|---|---|
| | 24…32 Vdc [ ] | 100…127 Vdc/ac [ ] |
| | 48…60 Vdc/ac [ ] | 220…250 Vdc/ac [ ] |

Shunt closing release - **YF**

| | | |
|---|---|---|
| 24 Vdc [ ] | 110 Vdc [ ] | 110 Vac (50 Hz) [ ] |
| 48 Vdc [ ] | 125-127 Vdc [ ] | 220-230 Vac (50 Hz) [ ] |
| | 220 Vdc [ ] | 120 Vac (60 Hz) [ ] |

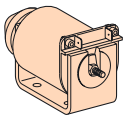
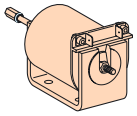
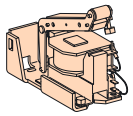
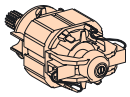
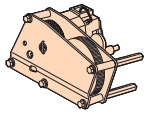
| | | |
|---|---|---|
| **Operation counter** (already included if remote control supplied) | | [ ] |
| **LV plug** | 21 pins LV plug [ ] | 42 pins LV plug [ ] |
| **Open position CB locking** (without lock) | | [ ] |
| **Lock** | Ronis [ ] | Profalux [ ] |
| **Pilot module** (with connecting kit) | | [ ] |
| | Without LV plug [ ] | With LV plug [ ] |
| **Diagnosis by Schneider Electric expert** (separated order) | | [ ] |

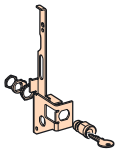
*Releases combinations table*

| | No LV plug or 42-pin LV plug | | | | | | 21-pin LV plug | |
|---|---|---|---|---|---|---|---|---|
| Shunt opening YO1 | 1 | | 1 | 1 | 1 | | 1 | |
| Shunt opening YO2 | | | 1 | | | | | |
| Undervoltage YM | | 1 | | 1 | | 1 | | |
| Mitop | | | | | 1 | 1 | | |

# Offer structure
## Separated components

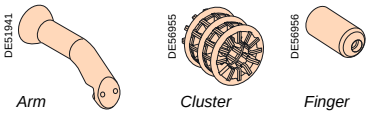
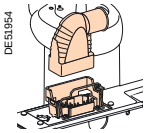
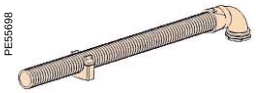
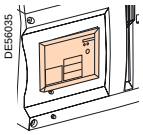
*The following components can be ordered separately and can be adapted or replaced by the customer.*

| Remote control | | | Ref. |
|---|---|---|---|
| **Shunt opening release YO1 or YO2** | | | |
| DE56037  | 24 Vdc | | **AAA10 115** |
| | 48 Vdc | | **AAA10 116** |
| | 110 Vdc | | **AAA10 117** |
| | 125-127 Vdc | | **AAA10 118** |
| | 220 Vdc | | **AAA10 119** |
| | 110 Vac | 50 Hz | **AAA10 120** |
| | 220-230 Vac | 50 Hz | **AAA10 121** |
| | 120 Vac | 60 Hz | **AAA10 122** |
| **Shunt closing release YF** | | | |
| DE56041  | 24 Vdc | | **AAA10 106** |
| | 48 Vdc | | **AAA10 107** |
| | 110 Vdc | | **AAA10 108** |
| | 125-127 Vdc | | **AAA10 109** |
| | 220 Vdc | | **AAA10 110** |
| | 110 Vac | 50 Hz | **AAA10 111** |
| | 220-230 Vac | 50 Hz | **AAA10 112** |
| | 120 Vac | 60 Hz | **AAA10 113** |
| **Undervoltage release YM** | | | |
| DE56033  | 24 Vdc | | **AAA10 124** |
| | 48 Vdc | | **AAA10 125** |
| | 110 Vdc | | **AAA10 126** |
| | 125-127 Vdc | | **AAA10 127** |
| | 220 Vdc | | **AAA10 128** |
| | 110 Vac | 50 Hz | **AAA10 129** |
| | 220-230 Vac | 50 Hz | **AAA10 130** |
| | 120 Vac | 60 Hz | **AAA10 131** |
| **Electrical motor** | | | |
| DE56042  | 24… 32 Vdc | | **AAA10 027** |
| | 48… 60 Vac/dc | | **AAA10 028** |
| | 100… 127 Vac/dc | | **AAA10 029** |
| | 220… 250 Vac/dc | | **AAA10 030** |
| DE56036  | Gear reducer | | **AAA10 065** |

| Locking, interlocking | Ref. |
|---|---|
| DE56039  | Open position CB locking device (without lock) | **AAA10 092** |
| | Ronis lock | **AAA10 058** |
| | Profalux lock | **AAA10 059** |
| | Interlocking kit fixed CB | **AAA10 033** |

# Offer structure
## Separated components (cont.)

### MV and LV connection accessories

| | | Ref. |
|---|---|---|
| **MV connection accessories** | | |
|  *Arm* *Cluster* *Finger* | | |
| Clusters set (including fingers) | 630-1250 A | **AAA10 025** |
| | 2500 A | **AAA10 026** |
| Arms set | 630-1250 A | **AAA10 022** |
| **LV connection** | | |
|  | | |
| 21-pin LV plug* | LV plug support | **AAA10 035** |
| | 21-pin plug | **AAA10 031** |
| 42-pin LV plug* | LV plug support | **AAA10 035** |
| | 42-pin plug | **AAA10 032** |
| (*) 2 references are necessary | | |
|  | | |
| Flexible conduct for LV wiring | | **59099** |
| LV connecting kit 24 wires | | **59117** |
| LV connecting kit 42 wires | | **AAA10 087** |
| **Monitoring device** | | |
|  | | |
| Pilot module (consult us) | | |

# Services

**The following components can only be adapted or replaced on site by staff trained by Schneider Electric:**

- the “Pilot” monitoring device
- remote control mechanism (comprising: electrical motor, gearing, shunt closing release, anti-pumping relay, operation counter)
- operation counter
- low energy release (Mitop)
- circuit breaker front cover.

# Evolis 24 kV withdrawable, frontal version

*Panorama* *11*
*Evolis 17.5 kV fixed, frontal version* *15*
*Evolis 17.5 kV withdrawable, frontal version* *33*
*Evolis 24 kV fixed, frontal version* *53*

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*Evolis and EVOset 24 kV fixed, lateral version* *87*
*Evolis Pilot monitoring device* *109*

# Main characteristics

PE55693

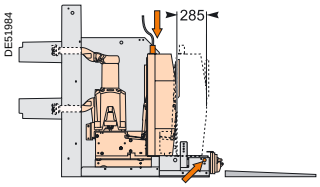
## Electrical characteristics according to IEC 62271-100

| Ur 24 kV | Isc | Ir | | |
|---|---|---|---|---|
| **Phase to phase distance (mm)** | | | **230** | **250** |
| Ud 50 kV 50 Hz, 1 min | 16 kA | 630 A | ■ | |
| Up 125 kV peak | | 1250 A | ■ | |
| | | 2000 A | | ■ |
| | | 2500 A | | ■ |
| | 25 kA | 630 A | ■ | |
| | | 1250 A | ■ | |
| | | 2000 A | | ■ |
| | | 2500 A | | ■ |
| | 31.5 kA | 630 A | | ■ |
| | | 1250 A | | ■ |
| | | 2000 A | | ■ |
| | | 2500 A | | ■ |

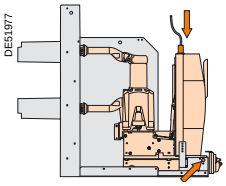
## Additional characteristics according to IEC 62271-100

| **Rated values** | | | |
|---|---|---|---|
| Voltage | **Ur** | kV rms | 24 |
| Insulation voltage: | | | |
| - power frequency withstand | **Ud** | kV rms | 50 |
| - lightning impulse withstand (1.2/50 µs) | **Up** | kV peak | 125 |
| Frequency | **fr** | Hz | 50-60 |
| Short time withstand current | **Ik/tk** | kA | Isc/3 s |
| Peak withstand current | **Ip** | kA peak | 2.5 Isc (50 Hz) |
| | | | 2.6 Isc (60 Hz) |
| Short circuit making capacity | | kA peak | 2.5 Isc (50 Hz) |
| | | | 2.6 Isc (60 Hz) |
| **Other characteristics** | | | |
| Operating sequence | | | O-0.3 s-CO-15 s-CO |
| | | | O-0.3 s-CO-3 min-CO |
| | | | O-3 min-CO-3 min-CO |
| Operating times | Opening | ms | < 50 |
| | Breaking | ms | < 65 |
| | Closing | ms | < 70 |
| Mechanical endurance | Class | | M2 |
| | Number of switching operations | | 10000 (30000 on request) |
| Electrical endurance | Class | | E2 |
| Number of switching operations at full Isc value | 16 kA | | 100 |
| | 25 kA | | 100 |
| | 31.5 kA | | 100 |
| Capacitive current breaking capacity | Class | | C1-C2 (for certain applications) |
| Operating conditions | | | –25°C to +40°C |
| Average relative humidity | Over 24 h | | < 95% |
| | Over 1 month | | < 90% |

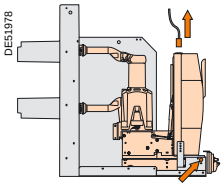
# Description of functions
## Racking in



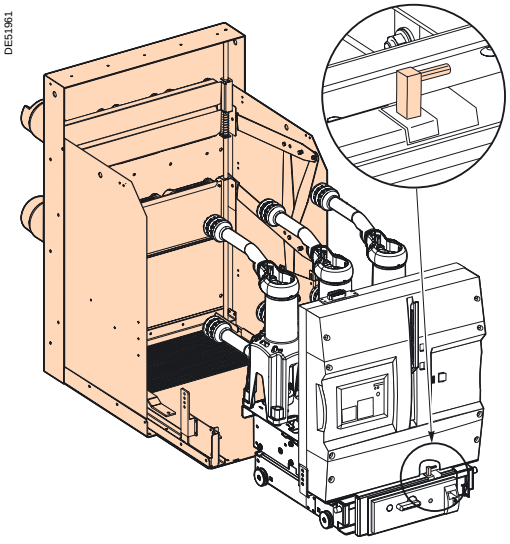
*Operating position*



*Test position*



*Disconnected position*



*Interlocking door-cubicle*

### Composition
The “racking in” function is carried out by:
- the racking carriage holding the circuit breaker (mobile part)
- the cradle with bushings (fixed part)
- LV plug.

### Operation
The circuit breaker can be placed in 3 stable positions:
- **service position:** circuit breaker racked in and locked in position, LV plug connected
- **test position:** circuit breaker racked out and locked in position, LV plug connected
- **disconnected position:** the circuit breaker can be unlocked and extracted from the cubicle, without interlocking.

### Safety functions
A drive system using a threaded shaft gives easier racking and unracking.

**Interlocking mechanisms**
In conformity with IEC standards 62271-100 and 62271-200, the following interlocks are available:
- impossibility of racking in or out is the circuit breaker is not in the “open” position
- impossible to rack in the circuit breaker when the LV plug is not connected
- impossible to disconnect the LV plug if the circuit breaker is not racked-out.

**Cubicle door interlocking mechanism**
The carriage is equipped with a device that enables interlocking between the racking out of the circuit breaker and the cubicle door (the door must be specifically designed):
- possible to rack in the circuit breaker only if the door is closed
- possible to open the door only if the circuit breaker is racked out.

This device must be disabled if the interlocking function is not present.

**Earthing** is achieved throughout the operation via the racking carriage casters. An addition earthing system can be supplied as an option.

**Protective shutters** placed on the cradle stops access to the racking fingers when the device is extracted (protection index: IP2X).

**For maintenance purpose, it is possible to:**
- padlock the shutters in the closed position
- unlock the fixed contact access mechanism and insert a screen

to insulate the energized contact set. A drawing is available on request to produce this protective screen (see Installation Guide).

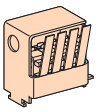
**A foolproof device** enables the cradle to be fitted perfectly to the circuit breaker relative to the cradle caliber.
This system is mounted on the cradle side. The combination corresponding to the right circuit breaker rating must be produced by the panel builder.

**Anti-drop function:**
This function provides operator safety when extracting the circuit breaker.

**Earthing switch**
It can be fitted under the cradle, to give the appropriate interlocking between the circuit breaker and the earthing switch (see detailed description in the “Earthing switch and cubicle components” catalogue).

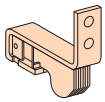
# Description of functions
## Racking in (cont.)

DE51950



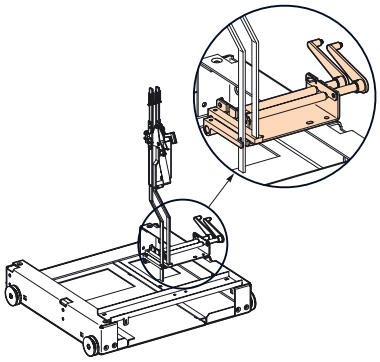
*Racked in/out position*

DE56855



*Earthing sliding device*

DE56025



*Auto-discharge function*

### Optional accessories

- 4 racked in/out position contacts.
- Additional earthing device (copper sliding device).
- LPCT tore type sensors, mounted directly on the cradle bushings.
- Auto-discharge function:

the circuit breaker operating mechanism springs are automatically discharged when the circuit breaker is extracted from the cubicle. This function avoids all risks of spurious closing of the circuit breaker.

- Test position contact.

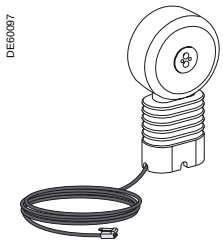
This contact is activated when the circuit breaker is in the “test” or “service” position.

- Access ramp for the circuit breaker in the cradle.

# Description of functions
## LPCT sensors

*LPCT sensors are the best way to increase the effectiveness of the protection chain and simplify the selection.*

*LPCT for bushings (TLP type)*




*LPCT for cubicle (CLP type)*

### Function
LPCT type sensors (Low Power Current Transducers) provide accurate measurement for protection functions when an Evolis circuit breaker is combined with a Sepam range relay.

They comply with IEC 60044-8 standard.

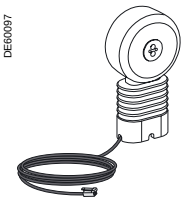
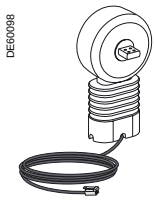
### Composition
Two types of LPCT are available:
- LPCT's for bushings, with LV insulation for cradle installation (TLP type)
- LPCT with MV insulation for cubicle installation (CLP type).

The sensor is supplied with 5 m of cable and connectors that allows direct connection to the Sepam unit.

### Mechanical characteristics (LPCT for bushings TLP type)
Mounted directly on the Evolis withdrawable circuit breaker cradle.
The sensors are simply located on the bushings and fixed using three screws.
Each sensor covers the full operating range of the corresponding circuit breaker.
Connection to the Sepam is achieved using a shielded cable which is attached to each sensor.

### Electrical characteristics:
- conformity with IEC standard 60044-8, which defines LPCT's with an output voltage
- usable for nominal currents of 25 A to 2500 A
- class 0.5 throughout the range
- current sensors give a voltage output at a ratio of 100 A/22.5 mV.

| Common features | |
|---|---|
| Rated primary current | 100 A |
| Rated secondary output (at 100 A) | 22.5 mV |
| Accuracy class for measuring | 0.5 |
| Accuracy class for protection | 5P |
| Burden | ⩾ 2 kΩ |
| Frequency | 50/60 Hz |

| Specific features | CLP2 | CLP3 | TLP160 | TLP190 |
|---|---|---|---|---|
| **Assembly** | **In the cubicle** | **In the cubicle** | **On the bushings** | **On the bushings** |
| |   |   | | |
| Rated extended primary current | 1250 A | 2500 A | 1250 A | 2500 A |
| Accuracy limit factor | 250 | 315 | 250 | 315 |
| Rated short time thermal current | 25 kA/3 s | 31.5 kA/3 s | 25 kA/3 s | 31.5 kA/3 s |
| Rated voltage | 24 kV | 24 kV | 24 kV (1) | 24 kV (1) |
| Rated power frequency withstand voltage | 50 kV | 50 kV | 50 kV | 50 kV |
| Rated lightning impulse withstand voltage | 125 kV | 125 kV | 125 kV | 125 kV |
| Internal diameter | | | 160 mm | 190 mm |

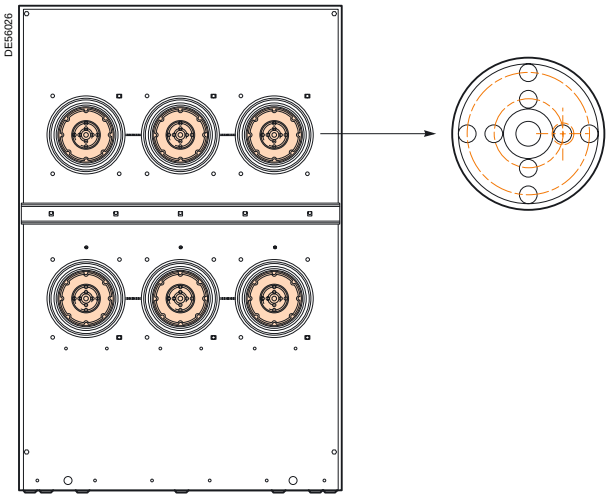
*(1) Voltage applied to the cradle equipped with sensors*

# Description of functions
## MV connection

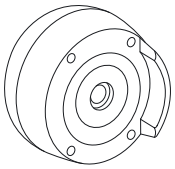
### Connection

The customer connection is carried out easily from outside the cradle on copper vertical connection terminals integrated in the bushings.

DE56026



DE60158

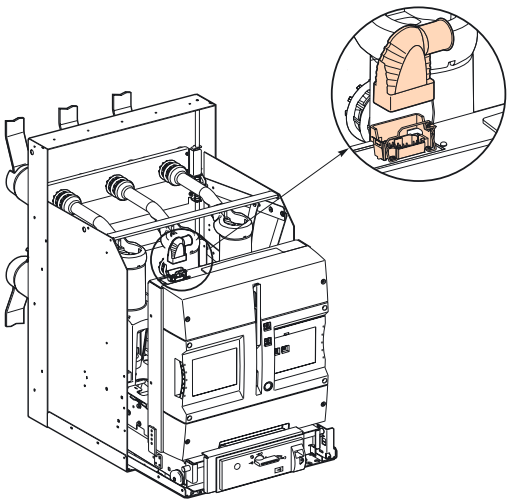


### Field deflectors

The aim of field deflectors is to improve the dielectric strength at the end of the cradle bushings. They are necessary in the case of installation in a NEX 24 kV type cubicle. For any other installation, the dielectric strength is the responsibility of the installation designer.

# Description of functions
## LV connection

DE51958



### Main functions
With the base circuit breaker, the LV wiring uses a LV plug unit which comprises:
- the fixed part (male) mounted on the circuit breaker and fully connected to the control mechanism
- the mobile part (female) compatible with the male part.

### Two versions of the LV plug are available

**An 21-pin version, enabling connection of:**
- a shunt opening release YO1
- an electrical remote control mechanism (electrical motor, shunt closing release YF, anti-pumping relay)
- the “Pilot” monitoring device
- a maximum number of auxiliary contacts: 3 NC - 3 NO - 1 changeover contact.

*(see “indication and locking/interlocking” page, “Open/closed position auxiliary contacts” chapter).*

***Note:** see the table of the releases’ combinations “Order form” page.*

**An 42-pin version, enabling connection of:**
- an opening release (shunt type YO1 or undervoltage type YM)
- a second opening release (shunt type YO2 or undervoltage type YM or Mitop low energy release)
- an electrical remote control mechanism (electrical motor, shunt closing release YF, anti-pumping relay)
- the “Pilot” monitoring device
- a maximum number of auxiliary contacts: 5 NC -6 NO -1 changeover contact.

*(see “indication and locking/interlocking” page, “Open/closed position auxiliary contacts” chapter).*

***Note:** see the table of the releases’ combinations “Order form” page.*

**Interlocking function**

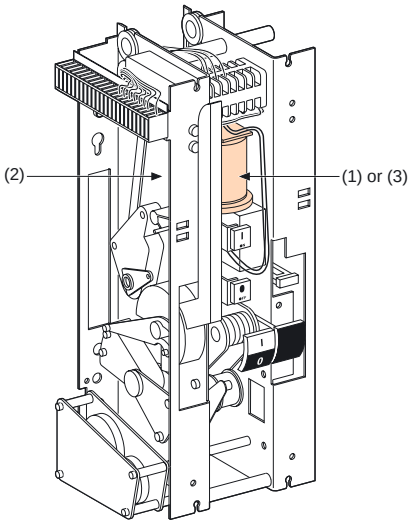
In conformity with IEC standard 62271-200, an interlocking function prohibits:
- racking in when the LV plug is not connected
- disconnection of the LV plug if the circuit breaker is in the racked-in position.

### LV wiring kit
A wiring kit with 21 or 42 wires (2 meters long) equipped with pins that can be adapted to the LV plug can be supplied for connected in to the cubicle’s LV compartment.

### Flexible ducting
This 525 mm long duct with a hinged LV plug, enables protection of the LV wiring that connects the circuit breaker to the cubicle’s LV compartment.

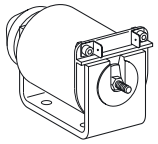
# Description of functions
## Opening circuit

DE56114EN



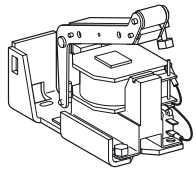

*Operating mechanism*

DE60094



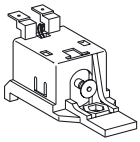
*Shunt opening release (1)*

DE60089



*Undervoltage release (2)*

DE60091



*Low energy release (3)*

### Composition

In its basic version, the circuit breaker includes a shunt opening release (YO1).
The opening circuit can be produced using the following components:

- second shunt opening release (on energizing) (YO2)
- undervoltage release (YM)
- low energy release (Mitop).

***Note:*** *see the table of the releases' combinations "Order form" page.*

### Shunt opening release (YO1 and YO2)

Energizing this release causes instant opening of the circuit breaker.

| Characteristics | | | |
|---|---|---|---|
| Power supply | | See "Order form" page | |
| Threshold | | V AC | 0.85 to 1.1 Un |
| | | V DC | 0.7 to 1.1 Un |
| Consumption | | V AC | 160 VA |
| | | V DC | 50 W |

### Undervoltage release (YM)

This release unit causes the systematic opening of the circuit breaker when its supply voltage drops below a value less than 35% of the rated voltage, even if this drop is slow and gradual. It can open the circuit breaker between 35% and 70% of its rated voltage. If the release unit is not supplied power, manual or electrical closing of the circuit breaker is impossible. Closing of the circuit breaker is possible when the supply voltage of the release unit reaches 85% of its rated voltage.

| Characteristics | | | |
|---|---|---|---|
| Power supply | | See "Order form" page | |
| Threshold | | Opening | 0.35 to 0.7 Un |
| | | Closing | 0.85 Un |
| Consumption | Triggering | V AC | 400 VA |
| | | V DC | 100 W |
| | Latched | V AC | 100 VA |
| | | V DC | 10 W |

### Low energy release (Mitop)

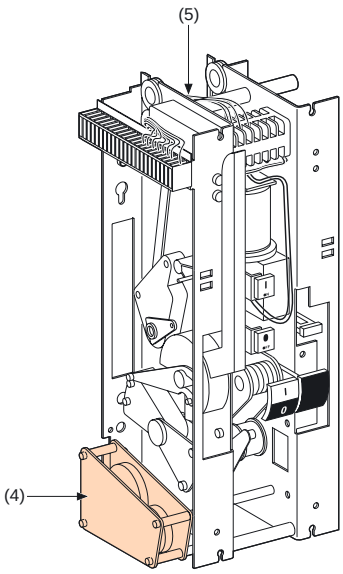
This release includes a low consumption unit and is specifically used with the Sepam 100LA self-powered relay ("REFLEX MODULE"), or the VIP relay.

| Characteristics | |
|---|---|
| Power supply | Direct current |
| Threshold | 0.6 A < I < 3 A |

Any tripping due to the Mitop release unit is momentarily indicated by an SDE type changeover contact (option).

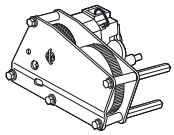
# Description of functions
## Remote control

DE56115



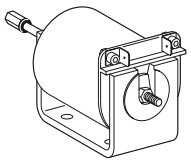

*Operating mechanism*

DE60093



*Electrical motor and gearing (4)*

DE60151



*Shunt closing release (5)*

### Function
Remote control enables the remote opening and closing of the circuit breaker.

### Composition
The remote control mechanism comprises:
- an electrical motor with gearing
- a shunt closing release (YF) combined with an anti-pumping device
- an operation counter.

### Electrical motor with gearing
The electrical motor carries out the automatic rearming of the stored energy unit as soon as the circuit breaker is closed. This allows the instant reclosing of the device after opening. The arming lever is only used as a backup operating mechanism in the case of the absence of the auxiliary power supply.
The M3 contact indicates the end of arming operations.

| Characteristics | | |
|---|---|---|
| Power supply | See “Order form” page | |
| Threshold | V AC/V DC | 0.85 to 1.1 Un |
| Consumption | V AC | 380 VA |
| | V DC | 380 W |

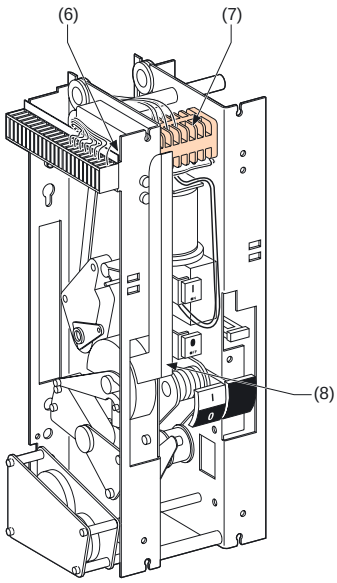
### Shunt closing release (YF)
This release allows the remote closing of the circuit breaker when the operating mechanism is armed.

| Characteristics | | |
|---|---|---|
| Power supply | See “Order form” page | |
| Threshold | V AC | 0.85 to 1.1 Un |
| | V DC | 0.85 to 1.1 Un |
| Consumption | V AC | 160 VA |
| | V DC | 50 W |

The shunt closing release is combined with an anti-pumping relay that enables priority to be given to opening in the case of a permanent closing order. This thus avoids the device being caught in an uncontrolled opening-closing cycle.

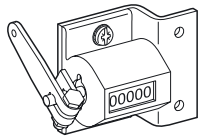
# Description of functions
## Indication and locking/interlocking

DE56116



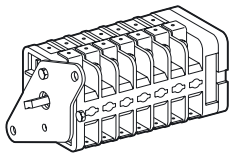

*Operating mechanism*

DE60087



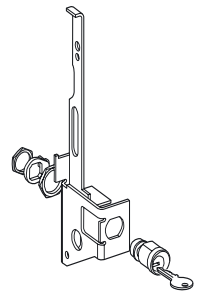
*Operation counter (6)*

DE51953



*Auxiliary contacts (7)*

DE60124



*Kit to lock the circuit breaker in the “open” position (8)*

### Operation counter

The operation counter is visible on the front panel.
It displays the number of switching cycles (CO) that the device has carried out.

### “Open/closed” auxiliary contacts (OC)

These auxiliary contacts indicate the “open” or “closed” position of the circuit breaker. The number of contacts available depends on the options chosen on the operating mechanism.

■ In the basic configuration, the circuit breaker operating mechanism comprises a total of:
- □ 5 normally closed contacts (NC)
- □ 6 normally open contacts (NO)
- □ 1 changeover contact (CHG).

The usage mode for auxiliary contacts is given in the following table:

| **Options** | | |
|---|---|---|
| | **NC contact** | **NO contact** |
| Remote control | 1 | 1 |
| Shunt opening release (each one) | 0 | 1 |
| Undervoltage release | 0 | 0 |
| Low energy release (Mitop) | 0 | 0 |
| Trip circuit supervision | 1 | 0 |

To know the final number of available contacts, you must deduct the total number of contacts included in the circuit breaker (5 NC + 6 NO + 1 CHG) from the number of contacts used indicated in the table below.
**E.g.:** a circuit breaker equipped with a remote control and a shunt release has the following contacts available:
4 NC + 4 NO + 1 CHG.
With an undervoltage release instead of a shunt release, this circuit breaker would have the following available contacts:
4 NC + 5 NO + 1 CHG.

■ Using a 21-pin LV plug (for withdrawable applications) the maximum number of available contacts is:
- □ 3 NC
- □ 3 NO
- □ 1 changeover.

*(Instead of 5 NC-6 NO-1 CHG with a 42-pin socket).*

| **Contact characteristics** | | | |
|---|---|---|---|
| Rated current | | | 10 A |
| Breaking capacity | AC | 220 V ($\cos \varphi \geq 0.3$) | 1 A |
| | DC | 110/220 V ($L/R \leq 0.02$ s) | 0.3 A |

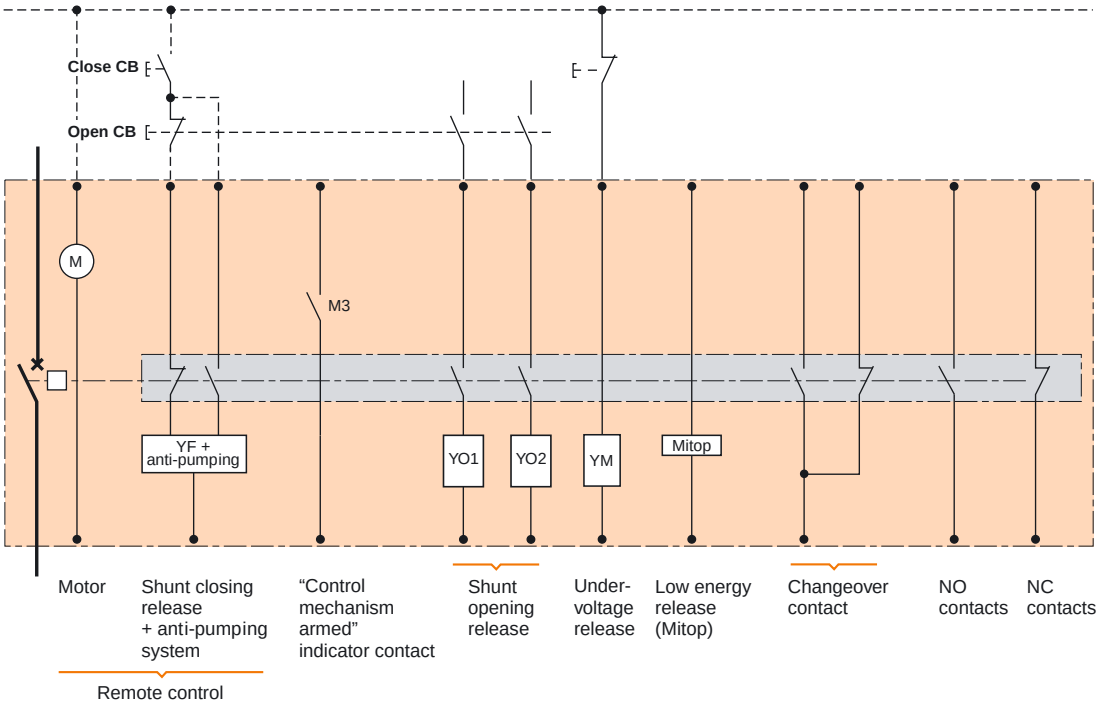
### Locking of the circuit breaker in the “open” position

This locking system enables the fitting of a Profalux or Ronis captive key type keylock (right turn type keylock).
The keylock is not part of the kit but can be supplied as an option.

# Description of functions
## Wiring diagram

DE56117EN

### Wiring diagram (principle)

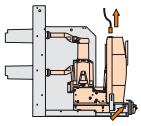
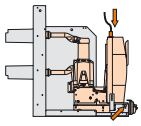
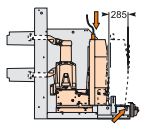


# Description of functions
## Safety functions

This table describes the safety functions available on the withdrawable version of the Evolis 24 kV circuit breaker.

**How to use the table**
Each of the boxes describes the functional status of each circuit breaker position and the associated parts:

- Possible status
- Possible status, operation impossible
- Impossible status

| Parts | | Circuit breaker positions | | | | | |
|---|---|---|---|---|---|---|---|
| | | | Insertion ⇢ / ⇠ Extraction |  |  | Racking-in ⇢ / ⇠ Racking-out |  |
| | | **Removed** | | **Disconnected** | **Test position** | | **Service** |
| **1 - Cradle** | | Fool-proof protection (1) / Anti-drop (2) | | | | | |
| | | No opening shutters | | | | | |
| | | Shutters padlocking possible | | | | | |
| **2 - LV plug** | Disconnected | | | No racking-in | | | |
| | Connected | | | | No unplugging | | |
| **3 - Circuit breaker** | Closed | | Auto-discharge function (3) | | No racking-in | | No racking-out |
| | Open | | | | | No closing | |
| | | Open position circuit breaker locking available (3) | | | | | |
| **4 - Switchboard door** | Open | | | | No racking-in | | |
| | Closed | | | | No door opening (4) | | |
| **5 - Earthing switch** | Open | | | | | No earthing switch closing | |
| | Closed | | | | No racking-in | | |

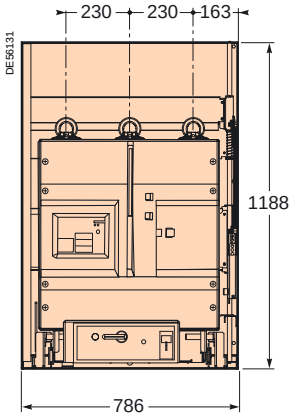
***(1)*** *This protection mechanism ensures that the performance levels of the circuit breaker correspond with those of the cradle.*
***(2)*** *Device that prevents the circuit breaker from dropping when extracted from the cradle.*
*The device can be either unlocked manually or when the extraction rig is put in position.*
***(3)*** *Option.*
***(4)*** *Interlocking device to be fitted to the cubicle door. If there is no interlocking, the circuit breaker device should be inhibited.*

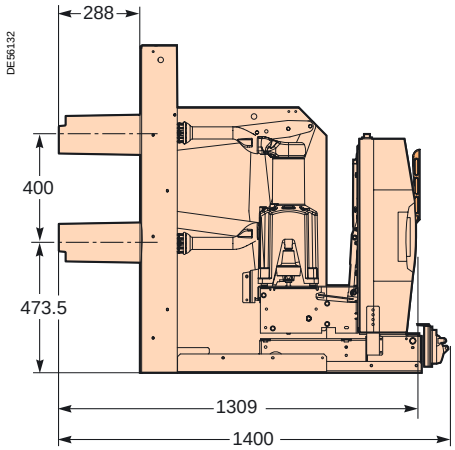
# Dimensions

## Device

### Phase to phase distance 230 mm

| Ur | Isc | Ir | Weight * |
|---|---|---|---|
| 24 kV | 16 kA | 630 A | 145 +125 kg |
| | | 1250 A | |
| | 25 kA | 630 A | |
| | | 1250 A | |

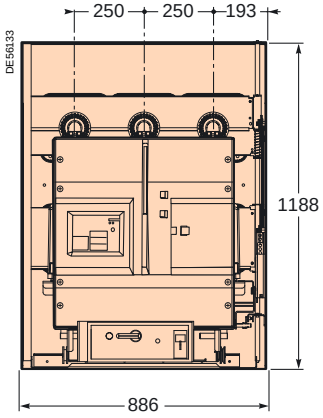


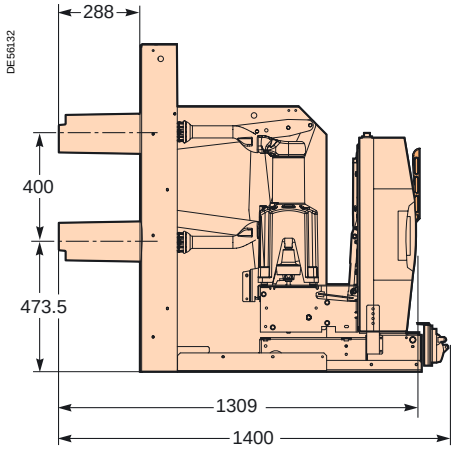




### Phase to phase distance 250 mm

| Ur | Isc | Ir | Weight * |
|---|---|---|---|
| 24 kV | 16 kA | 2000 A | 206 +148 kg |
| | | 2500 A | |
| | 25 kA | 2000 A | |
| | | 2500 A | |
| | 31.5 kA | 630 A | |
| | | 1250 A | |
| | | 2000 A | |
| | | 2500 A | |

(*) Circuit breaker + cradle




**Important**
Detailed installation instructions are given in the “Evolis Installation Guide”. Please consult us.

# Offer structure

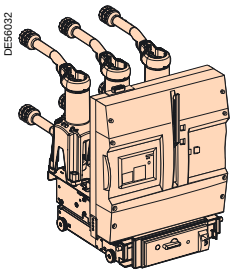
**The basic withdrawable, frontal circuit breaker includes:**
- 6 arms with clusters,
- racking truck with operating crank and screw-shaft system
- a manual operating mechanism (spring type)
- a 21-pin LV plug
- 1 shunt opening release YO1
- 1 block of auxiliary contacts
- an interlocking kit between the LV plug and the circuit breaker position O/C.

**The circuit breaker can receive options.**

**The cradle includes:**
- 6 bushings with fingers
- shutters
- shutters mechanism.

**The cradle can receive accessories.**

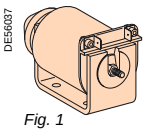
## Basic withdrawable, frontal circuit breaker

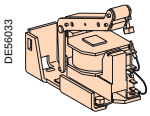

DE56032

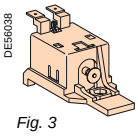
| Phase distance (mm) | | | 230 | 250 |
|---|---|---|---|---|
| **24 kV -** 125 kV peak | 16 kA | 630 A | ■ | |
| | | 1250 A | ■ | |
| | | 2000 A | | ■ |
| | | 2500 A | | ■ |
| | 25 kA | 630 A | ■ | |
| | | 1250 A | ■ | |
| | | 2000 A | | ■ |
| | | 2500 A | | ■ |
| | 31.5 kA | 630 A | | ■ |
| | | 1250 A | | ■ |
| | | 2000 A | | ■ |
| | | 2500 A | | ■ |

## Circuit breaker options

**Remote control** (see possible choices in combination table below)


DE56037
*Fig. 1*


DE56033
*Fig. 2*


DE56038
*Fig. 3*

**1st opening release**

Possibility of replacing YO1 by undervoltage release - **YM** *(fig. 2)*

**2nd opening release**

Shunt opening release - **YO2** *(fig. 1)*

Undervoltage release - **YM** *(fig. 2)*

Low energy release **Mitop** *(fig. 3)*

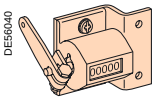
**Remote control including:**

Electrical motor, gear reducer, shunt closing release, anti-pumping relay, operation counter

*Releases combinations table*

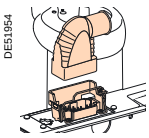
| | 42-pin LV plug | | | | | | 21-pin LV plug | |
|---|---|---|---|---|---|---|---|---|
| Shunt opening YO1 | 1 | | 1 | 1 | 1 | | 1 | |
| Shunt opening YO2 | | | 1 | | | | | |
| Undervoltage YM | | 1 | | 1 | | 1 | | |
| Mitop | | | | | 1 | 1 | | |

## Indication


DE56040

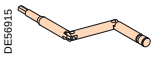
Operation counter (already included if remote control supplied)

## LV wiring connection


DE51954

LV plug: possibility of choosing a 42-pin LV plug instead of a 21-pin LV plug

## Rack-in/rack-out operation

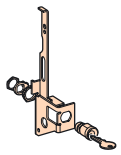

DE56915

Operating crank

# Offer structure (cont.)

## Locking/interlocking

DE56039



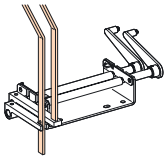
Open position circuit breaker locking device (without lock)

Ronis lock

Profalux lock

## Safety device

DE56043



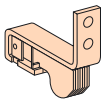
Operating mechanism auto discharge

230 mm phase distance circuit breaker

250 mm phase distance circuit breaker

## Earthing sliding device

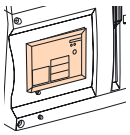
DE56855



Circuit breaker earthing sliding device

## Monitoring device

DE56035

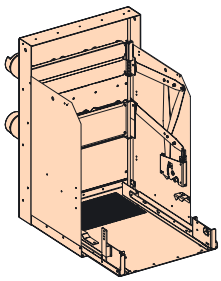


Pilot module (with connecting kit)

Diagnosis by Schneider Electric expert

## Cradle

DE56044



Cradle with 230 mm phase distance

Cradle with 250 mm phase distance

## Cradle accessories

DDE51950

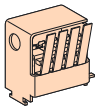


*Fig. 1*

DE56047

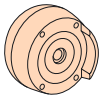


*Fig. 2*

Racked in/out position contacts (4 AC) *(fig.1)*

6 field deflectors for cradle bushings *(fig.2)* — 630-1250 A

2500 A

DE56045

*TPL 160*

DE56046

*TPL 190*

LPCT tore sensor

230 mm phase distance cradle (TLP 160) with insulating screen

230 mm phase distance cradle (TLP 190)

# Order form

Only one of the boxes (ticked [X] or filled [ ] by the needed value) have to be considered between each horizontal line.
Orange box [X] corresponds to none priced functions.

## Basic withdrawable, frontal circuit breaker

Quantity [ ]

| | | |
|---|---|---|
| **Rated voltage Ur** | **(kV)** | **24** |
| **Rated short-circuit breaking current Isc** | **(kA)** | |
| **Rated normal current Ir** | **(A)** | |
| **Phase distance (mm)** | **230** [ ] | **250** [ ] |

| **Colour for push buttons and indicators** | **IEC standard** | **ANSI standard** |
|---|---|---|
| Push buttons open/closed: | red/black [ ] | |
| Indicator open/closed: | black/white [ ] | green/red [ ] |
| Operating mechanism charged/discharged: | white/yellow [ ] | charge/discharge [ ] |

## Circuit breaker options

### 1st opening release (see possible choices in combination table below)

Shunt opening release - **YO1**

| | | |
|---|---|---|
| 24 Vdc [ ] | 110 Vdc [ ] | 110 Vac (50 Hz) [ ] |
| 48 Vdc [ ] | 125-127 Vdc [ ] | 220-230 Vac (50 Hz) [ ] |
| | 220 Vdc [ ] | 120 Vac (60 Hz) [ ] |

Undervoltage release - **YM**

| | | |
|---|---|---|
| 24 Vdc [ ] | 110 Vdc [ ] | 110 Vac (50 Hz) [ ] |
| 48 Vdc [ ] | 125-127 Vdc [ ] | 220-230 Vac (50 Hz) [ ] |
| | 220 Vdc [ ] | 120 Vac (60 Hz) [ ] |

### 2nd opening release (see possible choices in combination table below)

Shunt opening release - **YO2**

| | | |
|---|---|---|
| 24 Vdc [ ] | 110 Vdc [ ] | 110 Vac (50 Hz) [ ] |
| 48 Vdc [ ] | 125-127 Vdc [ ] | 220-230 Vac (50 Hz) [ ] |
| | 220 Vdc [ ] | 120 Vac (60 Hz) [ ] |

Undervoltage release - **YM**

| | | |
|---|---|---|
| 24 Vdc [ ] | 110 Vdc [ ] | 110 Vac (50 Hz) [ ] |
| 48 Vdc [ ] | 125-127 Vdc [ ] | 220-230 Vac (50 Hz) [ ] |
| | 220 Vdc [ ] | 120 Vac (60 Hz) [ ] |

Low energy release **Mitop** [ ]

### Remote control (operation counter already included)

Electrical motor

| | |
|---|---|
| 24…32 Vdc [ ] | 100…127 Vdc/ac [ ] |
| 48…60 Vdc/ac [ ] | 220…250 Vdc/ac [ ] |

Shunt closing release - **YF**

| | | |
|---|---|---|
| 24 Vdc [ ] | 110 Vdc [ ] | 110 Vac (50 Hz) [ ] |
| 48 Vdc [ ] | 125-127 Vdc [ ] | 220-230 Vac (50 Hz) [ ] |
| | 220 Vdc [ ] | 120 Vac (60 Hz) [ ] |

| | | |
|---|---|---|
| **Operation counter** (already included if remote control supplied) | | [ ] |
| **LV plug 42-pin** (instead of 21) | | [ ] |
| **Operating crank** | | [ ] |
| **Open position CB locking device** (without lock) | | [ ] |
| **Lock** | Ronis [ ] | Profalux [ ] |
| **Auto-discharge device** | | [ ] |
| **Earthing sliding contact** | | [ ] |
| **Pilot module** (with connecting kit and LV plug) | | [ ] |
| **Diagnosis by Schneider Electric expert** (separated order) | | [ ] |

## Cradle

| | | |
|---|---|---|
| **Rated current** | Up to 1250 A and 25 kA [ ] | Above 1250 A or 25 kA [ ] |

### Cradle accessories

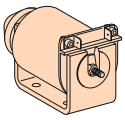
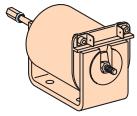
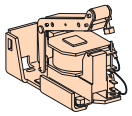
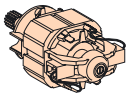
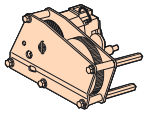
| | | |
|---|---|---|
| **Rack in/rack out position contact** (4 AC) | | [ ] |
| **LPCT-TLP** | Up to 1250 A and 25 kA [ ] | Above 1250 A or 25 kA [ ] |
| **6 field deflectors** | 630-1250 A [ ] | 2500 A [ ] |

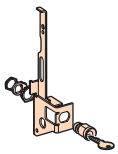
*Releases combinations table*

| | 42-pin LV plug | | | | | | | 21-pin LV plug | |
|---|---|---|---|---|---|---|---|---|---|
| Shunt opening YO1 | 1 | | 1 | 1 | 1 | | | 1 | |
| Shunt opening YO2 | | | 1 | | | | | | |
| Undervoltage YM | | 1 | | 1 | | 1 | | | |
| Mitop | | | | | 1 | 1 | | | |

# Offer structure
## Separated components

*The following components can be ordered separately and can be adapted or replaced by the customer.*

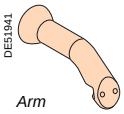
| Remote control | | | Ref. |
|---|---|---|---|
| **Shunt opening release YO1 or YO2** | | | |
|  DE56037 | 24 Vdc | | **AAA10 115** |
| | 48 Vdc | | **AAA10 116** |
| | 110 Vdc | | **AAA10 117** |
| | 125-127 Vdc | | **AAA10 118** |
| | 220 Vdc | | **AAA10 119** |
| | 110 Vac | 50 Hz | **AAA10 120** |
| | 220-230 Vac | 50 Hz | **AAA10 121** |
| | 120 Vac | 60 Hz | **AAA10 122** |
| **Shunt closing release YF** | | | |
|  DE56041 | 24 Vdc | | **AAA10 106** |
| | 48 Vdc | | **AAA10 107** |
| | 110 Vdc | | **AAA10 108** |
| | 125-127 Vdc | | **AAA10 109** |
| | 220 Vdc | | **AAA10 110** |
| | 110 Vac | 50 Hz | **AAA10 111** |
| | 220-230 Vac | 50 Hz | **AAA10 112** |
| | 120 Vac | 60 Hz | **AAA10 113** |
| **Undervoltage release YM** | | | |
|  DE56033 | 24 Vdc | | **AAA10 124** |
| | 48 Vdc | | **AAA10 125** |
| | 110 Vdc | | **AAA10 126** |
| | 125-127 Vdc | | **AAA10 127** |
| | 220 Vdc | | **AAA10 128** |
| | 110 Vac | 50 Hz | **AAA10 129** |
| | 220-230 Vac | 50 Hz | **AAA10 130** |
| | 120 Vac | 60 Hz | **AAA10 131** |
| **Electrical motor** | | | |
|  DE56042 | 24… 32 Vdc | | **AAA10 027** |
| | 48… 60 Vac/dc | | **AAA10 028** |
| | 100… 127 Vac/dc | | **AAA10 029** |
| | 220… 250 Vac/dc | | **AAA10 030** |
|  DE56036 | Gear reducer | | **AAA10 065** |

| Locking, interlocking | Ref. |
|---|---|
|  DE56039 | Open position CB locking device (without lock) | **AAA10 092** |
| | Ronis lock | **AAA10 058** |
| | Profalux lock | **AAA10 059** |

# Offer structure
## Separated components (cont.)

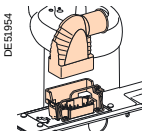
### MV and LV connection accessories

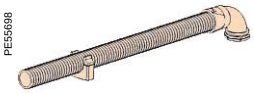
| | | Ref. |
|---|---|---|
| **MV connection accessories** | | |
| Clusters set (including fingers) | 630-1250 A | **AAA10 025** |
| | 2500 A | **AAA10 026** |
| Arms set | 630-1250 A | **AAA10 022** |



*Arm* *Cluster* *Finger*

| | | |
|---|---|---|
| **LV connection** | | |
| 21-pin LV plug* | LV plug support | **AAA10 035** |
| | 21-pin plug | **AAA10 031** |
| 42-pin LV plug* | LV plug support | **AAA10 035** |
| | 42-pin plug | **AAA10 032** |
| (*) 2 references are necessary | | |

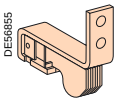



| | |
|---|---|
| Flexible conduct for LV wiring | **59099** |
| LV connecting kit 21 wires | **59117** |
| LV connecting kit 42 wires | **AAA10 087** |

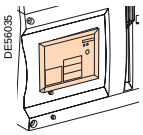
### Earthing sliding device

| | Ref. |
|---|---|
| Earthing sliding contact | **59456** |



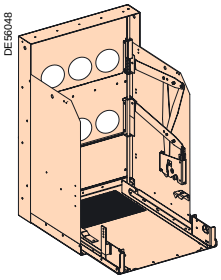

### Monitoring device

Pilot module (consult us)




### Cradle

| | | Ref. |
|---|---|---|
| **Cradle without bushings** | | |
| Cradle with 230 mm phase distance | | **AAA10 015** |
| Cradle with 250 mm phase distance | | **AAA10 017** |




| | | |
|---|---|---|
| **Cradle accessories** | | |
| Bushing kit for cradle *(fig.1)* | 630-1250 A | **AAA10 016** |
| | 2500 A | **AAA10 018** |
| 6 field deflectors for cradle bushings *(fig.2)* | 630-1250 A | **AAA10 020** |
| | 2500 A | **AAA10 021** |
| 4 racked in/out position contacts *(fig.3)* (to be installed in the cradle) | | **59173** |

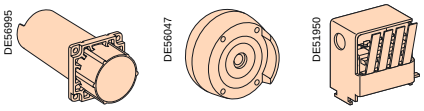
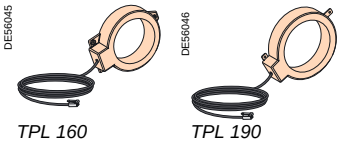


*Fig. 1* *Fig. 2* *Fig. 3*

| | | |
|---|---|---|
| LPCT toroidal sensor | TLP 160 (up to 1250 A) | **AAA10 094** |
| | TLP 190 (above) | **AAA10 095** |



*TPL 160* *TPL 190*

# Services

**The following components can only be adapted or replaced on site by staff trained by Schneider Electric:**

- the “Pilot” monitoring device
- remote control mechanism (comprising: electrical motor, gearing, shunt closing release, anti-pumping relay, operation counter)
- operation counter
- low energy release (Mitop)
- interlocking between the “open” circuit breaker position and the LV plug
- racking truck
- auto-discharge device
- circuit breaker front cover.

# Evolis and EVOset 24 kV fixed, lateral version

*Panorama* *11*
*Evolis 17.5 kV fixed, frontal version* *15*
*Evolis 17.5 kV withdrawable, frontal version* *33*
*Evolis 24 kV fixed, frontal version* *53*
*Evolis 24 kV withdrawable, frontal version* *67*

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# Main characteristics

PE55931

*Evolis 24 kV fixed, lateral version*
*MV connection on the right hand side*

PE55930

*Evolis 24 kV fixed, lateral version*
*MV connection on the left hand side*

## Electrical characteristics according to IEC 62271-100

| **Ur 24 kV** | **Isc** | **Ir** | | | | |
|---|---|---|---|---|---|---|
| **Phase to phase distance (mm)** | | | **250** | | **300** | |
| **MV connection on the:** | | | **right** | **left** | **right** | **left** |
| Ud 50 kV 50 Hz, 1 min | 12.5 kA | 630 A | ■ | ■ | ■ | |
| Up 125 kV peak | | 1250 A | ■ | ■ | | |
| | 16 kA | 630 A | ■ | ■ | ■ | ■ |
| | | 1250 A | ■ | ■ | ■ | |
| | 20 kA | 630 A | ■ | ■ | ■ | |
| | | 1250 A | ■ | ■ | ■ | ■ |
| | 25 kA | 630 A | ■ | ■ | ■ | |
| | | 1250 A | ■ | ■ | ■ | |

## Additional characteristics according to IEC 62271-100

| **Rated values** | | | |
|---|---|---|---|
| Voltage | **Ur** | kV rms | 24 |
| Insulation voltage: | | | |
| - power frequency withstand | **Ud** | kV rms | 50 |
| - lightning impulse withstand (1.2/50 µs) | **Up** | kV peak | 125 |
| Frequency | **fr** | Hz | 50-60 |
| Short time withstand current | **Ik/tk** | kA | Isc/3 s |
| Peak withstand current | **Ip** | kA peak | 2.5 Isc (50 Hz) |
| | | | 2.6 Isc (60 Hz) |
| Short circuit making capacity | | kA peak | 2.5 Isc (50 Hz) |
| | | | 2.6 Isc (60 Hz) |
| **Other characteristics** | | | |
| Operating sequence | | | O-0.3 s-CO-15 s-CO |
| | | | O-0.3 s-CO-3 min-CO |
| | | | O-3 min-CO-3 min-CO |
| Operating times | Opening | ms | < 50 |
| | Breaking | ms | < 60 |
| | Closing | ms | < 65 |
| Mechanical endurance | Class | | M2 |
| | Number of switching operations | | 10000 |
| Electrical endurance | Class | | E2 |
| Number of switching operations at full Isc value | 12.5 kA | | 100 |
| | 16 kA | | 100 |
| | 20 kA | | 100 |
| | 25 kA | | 100 |
| Capacitive current breaking capacity | Class | | C1-C2 (for certain applications) |
| Operating conditions | | | –25°C to +40°C |
| Average relative humidity | Over 24 h | | < 95% |
| | Over 1 month | | < 90% |

# Main characteristics

PE55932

*EVOset 24 kV fixed, lateral version*
*MV connection on the right hand side*

## Electrical characteristics according to IEC 62271-100

| **Ur 24 kV** | **Isc** | **Ir** | | | | |
|---|---|---|---|---|---|---|
| **Phase to phase distance (mm)** | | | **250** | | **300** | |
| **MV connection on the:** | | | **right** | **left** | **right** | **left** |
| Ud 50 kV 50 Hz, 1 min | 12.5 kA | 630 A | ■ | | ■ | |
| Up 125 kV peak | | 1250 A | ■ | | ■ | |
| | 16 kA | 630 A | ■ | | ■ | |
| | | 1250 A | ■ | | ■ | |
| | 20 kA | 630 A | ■ | | ■ | |
| | | 1250 A | ■ | | ■ | |

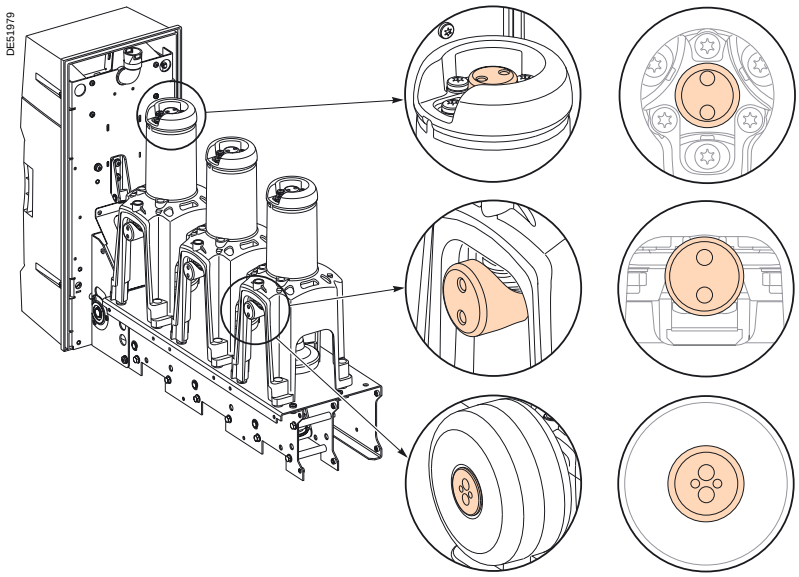
## Additional characteristics according to IEC 62271-100

| **Rated values** | | | |
|---|---|---|---|
| Voltage | **Ur** | kV rms | 24 |
| Insulation voltage: | | | |
| - power frequency withstand | **Ud** | kV rms | 50 |
| - lightning impulse withstand (1.2/50 µs) | **Up** | kV peak | 125 |
| Frequency | **fr** | Hz | 50-60 |
| Short time withstand current | **Ik/tk** | kA | Isc/3 s |
| Peak withstand current | **Ip** | kA peak | 2.5 Isc (50 Hz) |
| | | | 2.6 Isc (60 Hz) |
| Short circuit making capacity | | kA peak | 2.5 Isc (50 Hz) |
| | | | 2.6 Isc (60 Hz) |
| **Other characteristics** | | | |
| Operating sequence | | | O-0.3 s-CO-15 s-CO |
| | | | O-0.3 s-CO-3 min-CO |
| | | | O-3 min-CO-3 min-CO |
| Operating times | Opening | ms | < 50 |
| | Breaking | ms | < 60 |
| | Closing | ms | < 65 |
| Mechanical endurance | Class | | M2 |
| | Number of switching operations | | 10000 |
| Electrical endurance | Class | | E2 |
| Number of switching operations at full Isc value | 12.5 kA | | 100 |
| | 16 kA | | 100 |
| | 20 kA | | 100 |
| Capacitive current breaking capacity | Class | | C1-C2 (for certain applications) |
| Operating conditions | | | –25°C to +40°C |
| Average relative humidity | Over 24 h | | < 95% |
| | Over 1 month | | < 90% |

# Description of functions
## MV and LV connections

### MV connection

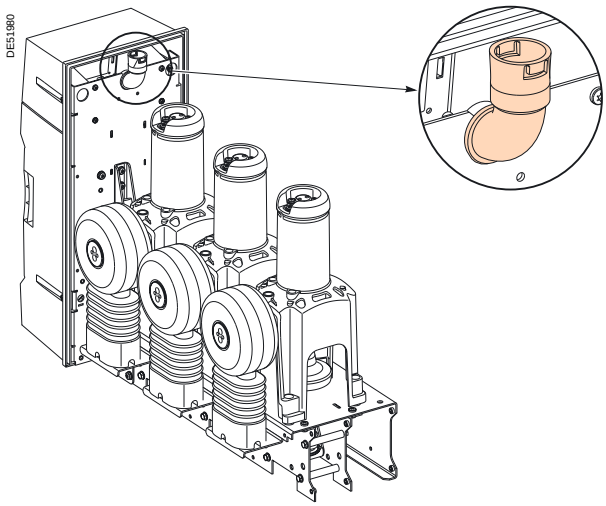
The base circuit breaker is equipped with copper connection terminals with drilled holes.
The customer connection is carried out easily from outside the circuit breaker on these connection terminals.




Connection configurations that have undergone type testing are shown in the Installation Guide.

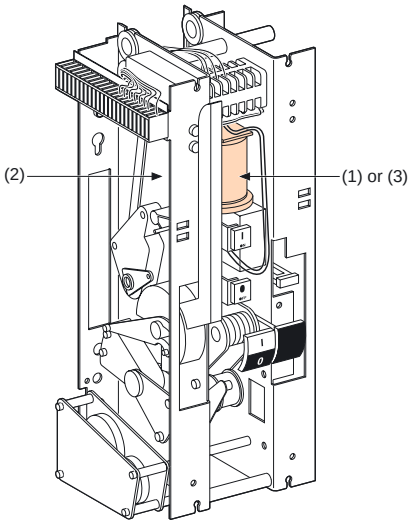
### LV connection

The circuit breaker's LV wiring must be directly connected to the terminal on the control mechanism via a protection sheath.



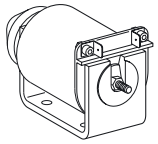
# Description of functions
## Opening circuit

DE56114EN



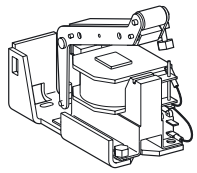

*Operating mechanism*

DE60094



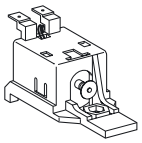
*Shunt opening release (1)*

DE60089



*Undervoltage release (2)*

DE60091



*Low energy release (3)*

## Composition

**Evolis circuit breaker**

In its basic version, the circuit breaker includes a shunt opening release (YO1).
The opening circuit can be produced using the following components:
- second shunt opening release (on energizing) (YO2)
- undervoltage release (YM)
- low energy release (Mitop).

**EVOset circuit breaker**

In its basic version, the circuit breaker includes a low energy release (Mitop).

In addition, the opening circuit can be produced using the following components:
- shunt opening release (YO1)
- undervoltage release (YM).

An external power supply is necessary in this case.

***Note:*** *see the table of the releases' combinations "Order form" page.*

## Shunt opening release (YO1 and YO2)

Energizing this release causes instant opening of the circuit breaker.

| Characteristics | | |
|---|---|---|
| Power supply | See "Order form" page | |
| Threshold | V AC | 0.85 to 1.1 Un |
| | V DC | 0.7 to 1.1 Un |
| Consumption | V AC | 160 VA |
| | V DC | 50 W |

## Undervoltage release (YM)

This release unit causes the systematic opening of the circuit breaker when its supply voltage drops below a value less than 35% of the rated voltage, even if this drop is slow and gradual. It can open the circuit breaker between 35% and 70% of its rated voltage. If the release unit is not supplied power, manual or electrical closing of the circuit breaker is impossible. Closing of the circuit breaker is possible when the supply voltage of the release unit reaches 85% of its rated voltage.

| Characteristics | | | |
|---|---|---|---|
| Power supply | | See "Order form" page | |
| Threshold | | Opening | 0.35 to 0.7 Un |
| | | Closing | 0.85 Un |
| Consumption | Triggering | V AC | 400 VA |
| | | V DC | 100 W |
| | Latched | V AC | 100 VA |
| | | V DC | 10 W |

## Low energy release (Mitop)

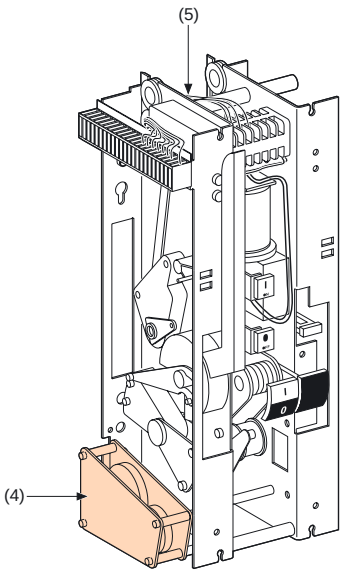
This release includes a low consumption unit and is specifically used with the Sepam 100LA self-powered relay ("REFLEX MODULE"), or the VIP relay.

| Characteristics | |
|---|---|
| Power supply | Direct current |
| Threshold | 0.6 A < I < 3 A |

Any tripping due to the Mitop release unit is momentarily indicated by an SDE type changeover contact (option).

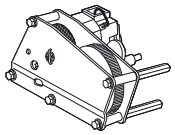
# Description of functions
## Remote control

DE56115



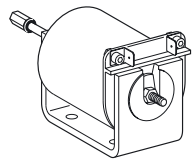

*Operating mechanism*

DE60093



*Electrical motor and gearing (4)*

DE60151



*Shunt closing release (5)*

### Function
Remote control enables the remote opening and closing of the circuit breaker.

### Composition
The remote control mechanism comprises:
- an electrical motor with gearing
- a shunt closing release (YF) combined with an anti-pumping device
- an operation counter.

### Electrical motor with gearing
The electrical motor carries out the automatic rearming of the stored energy unit as soon as the circuit breaker is closed. This allows the instant reclosing of the device after opening. The arming lever is only used as a backup operating mechanism in the case of the absence of the auxiliary power supply.
The M3 contact indicates the end of arming operations.

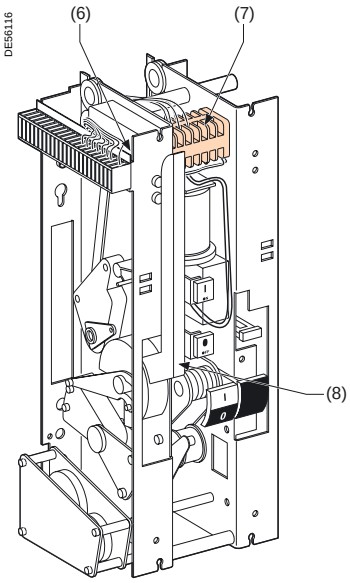
| Characteristics | | |
|---|---|---|
| Power supply | See “Order form” page | |
| Threshold | V AC/V DC | 0.85 to 1.1 Un |
| Consumption | V AC | 380 VA |
| | V DC | 380 W |

### Shunt closing release (YF)
This release allows the remote closing of the circuit breaker when the operating mechanism is armed.

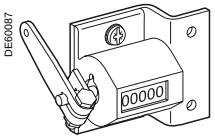
| Characteristics | | |
|---|---|---|
| Power supply | See “Order form” page | |
| Threshold | V AC | 0.85 to 1.1 Un |
| | V DC | 0.85 to 1.1 Un |
| Consumption | V AC | 160 VA |
| | V DC | 50 W |

The shunt closing release is combined with an anti-pumping relay that enables priority to be given to opening in the case of a permanent closing order. This thus avoids the device being caught in an uncontrolled opening-closing cycle.

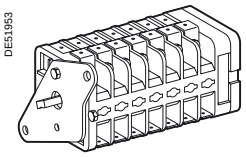
# Description of functions
## Indication and locking/interlocking



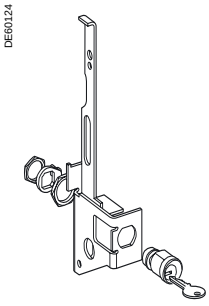

*Operating mechanism*




*Operation counter (6)*




*Auxiliary contacts (7)*




*Kit to lock the circuit breaker in the “open” position (8)*

### Operation counter

The operation counter is visible on the front panel.
It displays the number of switching cycles (CO) that the device has carried out.

### “Open/closed” auxiliary contacts (OC)

These auxiliary contacts indicate the “open” or “closed” position of the circuit breaker. The number of contacts available depends on the options chosen on the operating mechanism.

In the basic configuration, the circuit breaker operating mechanism comprises a total of:
- 5 normally closed contacts (NC)
- 6 normally open contacts (NO)
- 1 changeover contact (CHG).

The usage mode for auxiliary contacts is given in the following table:

| **Options** | **NC contact** | **NO contact** |
|---|---|---|
| Remote control | 1 | 1 |
| Shunt opening release (each one) | 0 | 1 |
| Undervoltage release | 0 | 0 |
| Low energy release (Mitop) | 0 | 0 |
| Trip circuit supervision | 1 | 0 |

To know the final number of available contacts, you must deduct the total number of contacts included in the circuit breaker (5 NC + 6 NO + 1 CHG) from the number of contacts used indicated in the table below.
**E.g.:** a circuit breaker equipped with a remote control and a shunt release has the following contacts available:
4 NC + 4 NO + 1 CHG.
With an undervoltage release instead of a shunt release, this circuit breaker would have the following available contacts:
4 NC + 5 NO + 1 CHG.

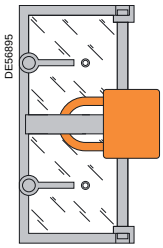
| **Contact characteristics** | | | |
|---|---|---|---|
| Rated current | | | 10 A |
| Breaking capacity | AC | 220 V (cos φ ≥ 0.3) | 1 A |
| | DC | 110/220 V (L/R ≤ 0.02 s) | 0.3 A |

### Locking of the circuit breaker in the “open” position

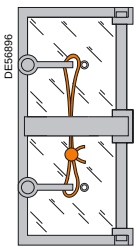
This locking system enables the fitting of a Profalux or Ronis captive key type keylock (right turn type keylock).
The keylock is not part of the kit but can be supplied as an option.

### Push button locking

This transparent screen blocks access to the opening and closing push-buttons on the circuit breaker.
The device enables the opening or closing push button to be locked independently.
It is often associated with an electrical motor.
Locking is achieved either:
- by 2 screws
- by 3 padlocks, not supplied
- by a lead seal.




*Padlocking*

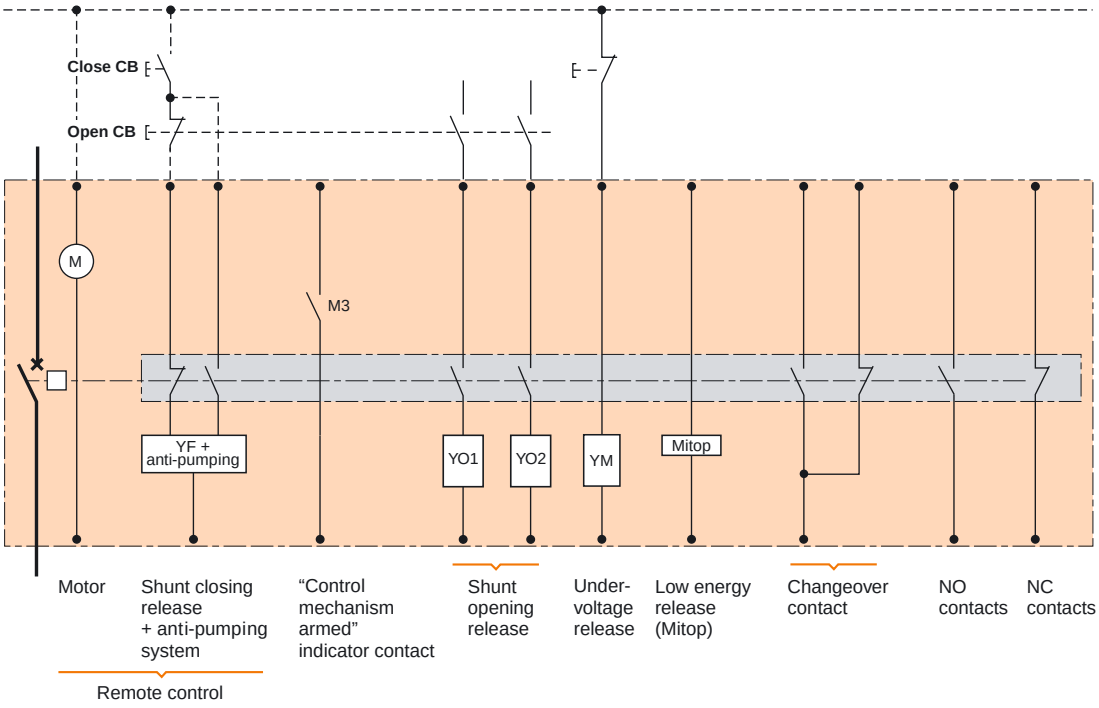



*Lead sealing*

# Description of functions
## Wiring diagram

DE56117EN

### Wiring diagram (principle)



# Protection, monitoring and control
## EVOset: integrated protection chain by a VIP relay

PE55932

*EVOset with a VIP protection unit installed on the front panel*

PE55933

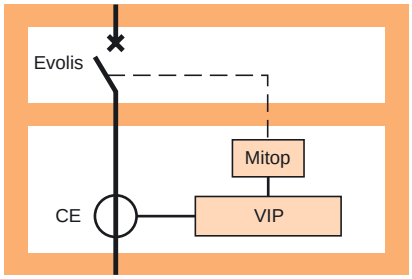
*VIP300LL protection unit*

### The EVOset circuit breaker has an independent protection chain

The EVOset circuit breaker comprises an Evolis circuit breaker into which is integrated a protection chain comprising:
- a set of current sensors installed on the lower current terminals of the circuit breaker: type CEc, CEa or CEb
- a VIP protection relay mounted on the control unit: of type VIP30, VIP35, VIP300P or VIP300LL
- a “Mitop” low energy release installed on the circuit breaker operating mechanism.

The unit is fully independent and functions without an auxiliary power supply.

DE56137




*EVOset schematic diagram*

### Independent protection chain operating principle

The protection chain is supplied with power by sensors which supply:
- the “current” information”, processed by the VIP protection unit
- the electrical power required for the whole protection chain to operate;

VIP relay and Mitop release.
All settings are visible and accessible from the front of the device.
To achieve the indicated performance levels, the VIP relay must be used with the specified sensors. The combination of the unit/sensor is essential in order to comply with the indicated characteristics and in particular with:
- operation throughout the whole range
- trip times
- precision
- short circuit thermal withstand.

The sensors on each of the phases must be of the same type.

### Hardware description for the VIP relay

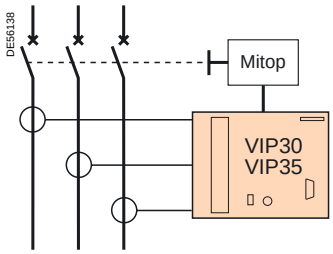
The VIP relay is mounted in an injected polycarbonate casing which protects it against run off water and dusty atmospheres.
The front face is protected by a transparent cover with a seal.
This cover can be sealed to prohibit access to settings.
Settings are made with rotary switches. The phase service current and the earthing current limit are set directly in Amps. Therefore, the graduation on the front face must be adapted to the rating used on the sensor; this is achieved by a “graduation plate” must be positioned on the relay when fitted.
Connection is carried out at the rear of the relay using fast-on clips.

# Protection, monitoring and control
## VIP30 and VIP35 protection units

### Use

Independent protection units VIP30 and VIP35 are intended for use on distribution networks, mainly in MV/LV substations where they provide upstream protection of the transformer.

These are independent relays that do not require any auxiliary power supply; they are powered by the current sensors. The relays directly actuate the “Mitop” release.




*Simplified connection arrangement*

The associated current sensors of type **CEc** give a setting range of (Is) 8 A to 200 A for the service current.

### VIP30 relay

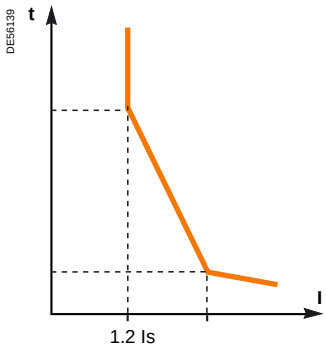
This provides protection against phase-to-phase faults.
The protection curve is similar to a fuse curve.
Phase protection is achieved using an inverse definite time threshold from 1.2 times the service current (Is).

### VIP35 relay

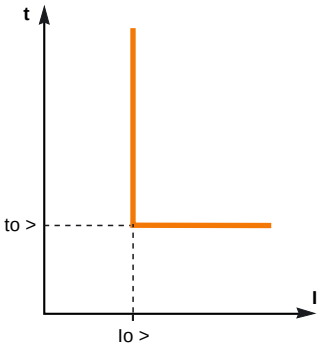
This provides protection against phase-to-phase faults and against earthing faults:
- the phase protection is identical to the VIP30
- the earthing fault protection functions with the measurement of residual current calculated from the sum of the sensor secondary currents.

This measurement is made by a CSH30 core balance CT mounted at the back of the VIP casing.
Earthing protection is definite time; its threshold and time delay can be adjusted.

### Trip curves



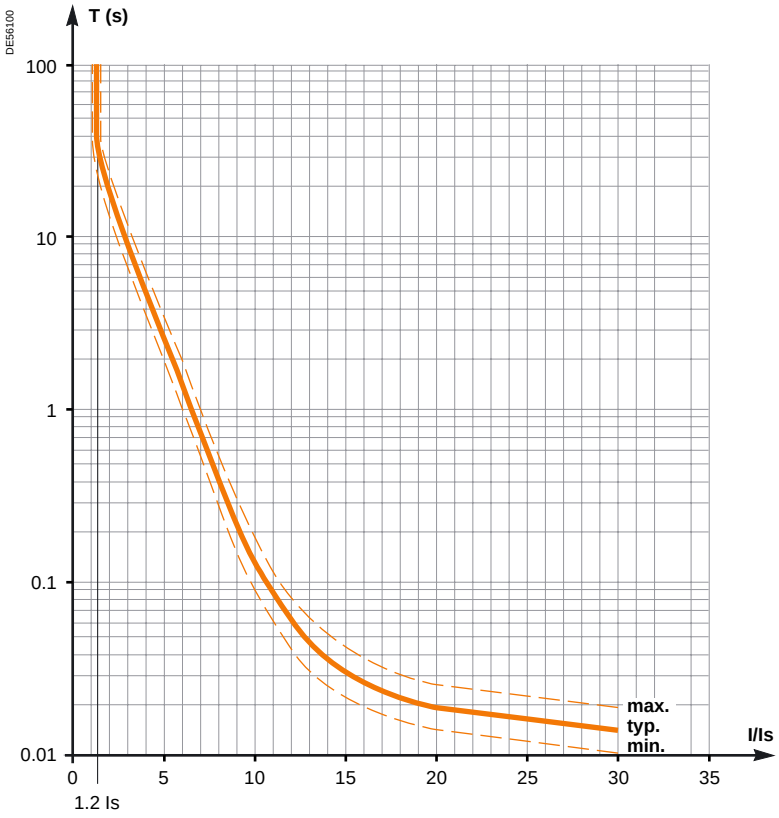

*VIP30/VIP35: phase protection curve*




*VIP35: earth protection curve*

# **Protection, monitoring and control**
## VIP30 and VIP35 protection units (cont.)

**Phase protection trip curve:**
**VIP30 and VIP35**

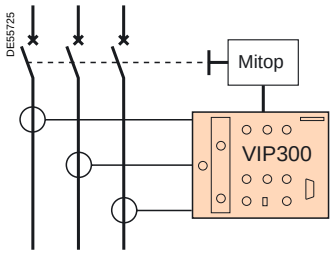


# Protection, monitoring and control
## VIP300P protection relay and VIP300LL

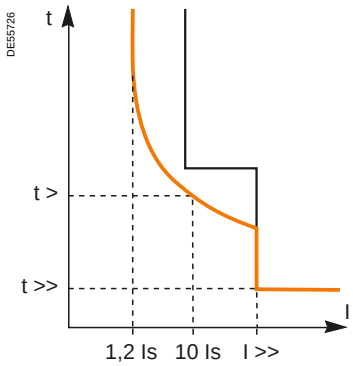
### Use

Independent protection units VIP300P and 300LL are intended for use on distribution networks. They can be used to protect MV/LV transformers, to protect the head of the industrial installation, but also to protect branches.

These are independent relays that do not require any auxiliary power supply; they are powered by the current sensors. The relays directly actuate the “Mitop” release.




*Simplified connection arrangement*




*Phase and earthing protection curve*

The associated current sensors of type **CEa** and **CEb** give a setting range for the service current (Is) of 10 A to 1250 A.

### VIP300P relay

This provides protection against phase-to-phase faults
Phase protection has two independently adjustable thresholds:
- the lower threshold can be chosen to be either definite time or inverse definite time. It can be executed according to the RI curve.
- the upper threshold is inverse definite time.

The definite time curves are in conformity with standard IEC 60255-3.
They are either of type inverse (SI), very inverse (VI) and extremely inverse (EI).

### VIP300LL relay

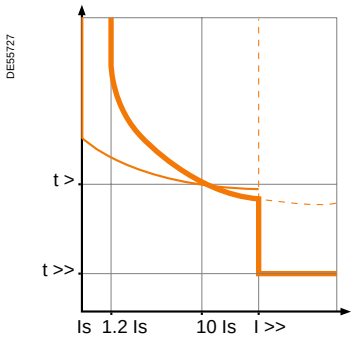
This provides protection against phase-to-phase faults and against earthing faults:
- the phase protection is identical to the VIP300P
- earthing fault protection functions with the measurement of residual current: this is carried out based on the sum of secondary currents in the sensors.

As for phase protection, earthing protection has two independently adjustable thresholds.

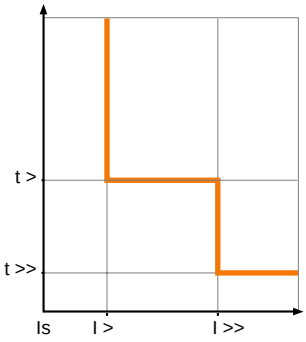
### Indication

Two indicators show the origin of tripping (phase or earth).
They stay in position after breaking the relay power supply.
Two LED indicator lights (phase and earth) show that the lower threshold has been exceeded and that the time delay has been started.

## Trip curves

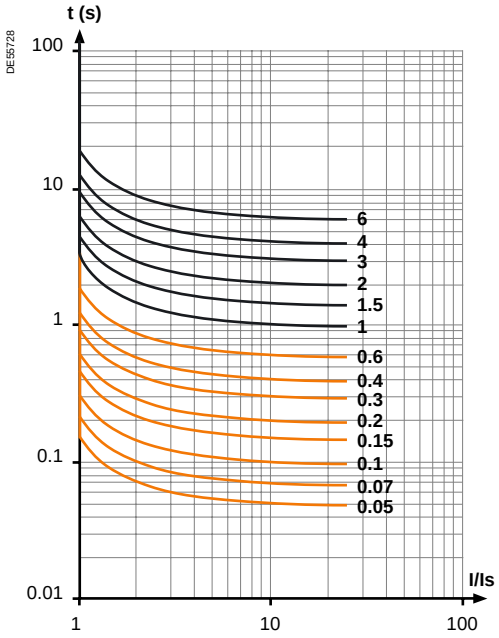



*With a definite time lower threshold*

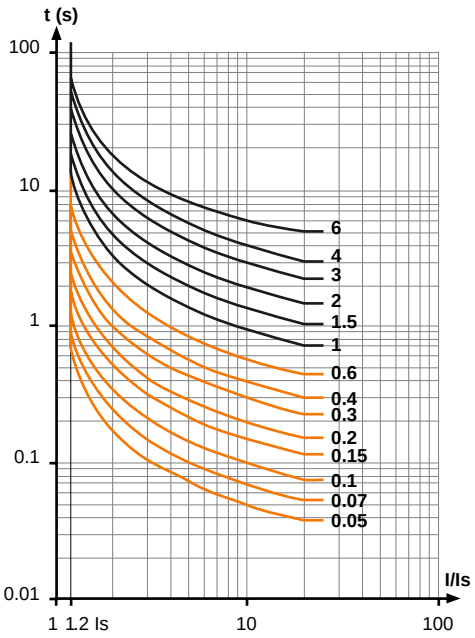



*With an inverse definite time lower threshold*

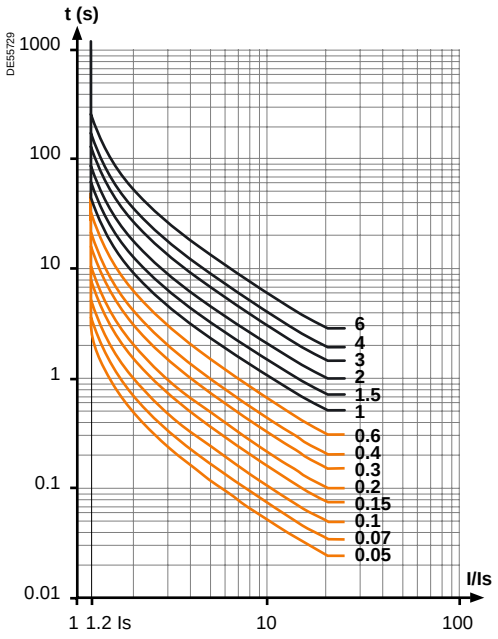
## Definite time trip curves



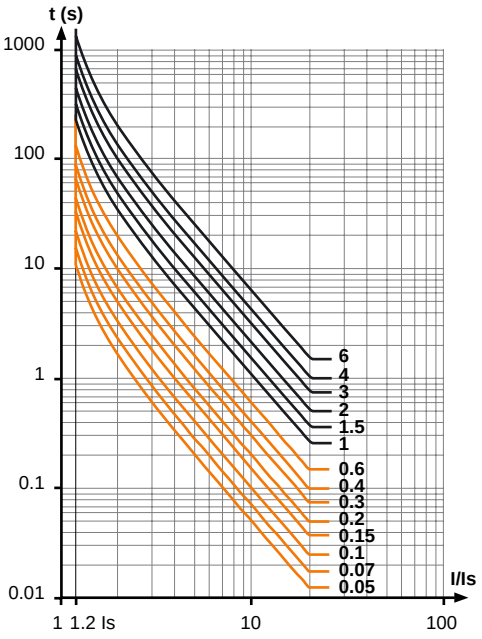

*RI curve*




*SI curve*




*VI curve*




*EI curve*

# Protection, monitoring and control
## Current sensors and test unit for VIP relays

PE55935

*CE type current sensors*

PE55774

*VAP6 test unit*

### Current sensors for VIP relays

In order to achieve the specified performance levels, the VIP protection relays must be used with the specified sensors. The relay/sensor pairing is indissociable.
in order to comply with characteristics and in particular:

- operation throughout the whole range
- response time
- precision
- short circuit thermal withstand.

| Sensor type | Relay | Service current (Is) |
|---|---|---|
| **CEc** | VIP30/VIP35 | 8 A to 200 A |
| **CEa** | VIP300P/VIP300LL | 10 A to 200 A |
| **CEb** | VIP300P/VIP300LL | 63 A to 1250 A |

### VAP6 test unit for VIP relays

VIP type protection units have a **"test" socket** to connect a VAP6 test unit. This portable unit with its own power supply enables the correct functioning of the protection relay to be checked.

# Dimensions

## Evolis

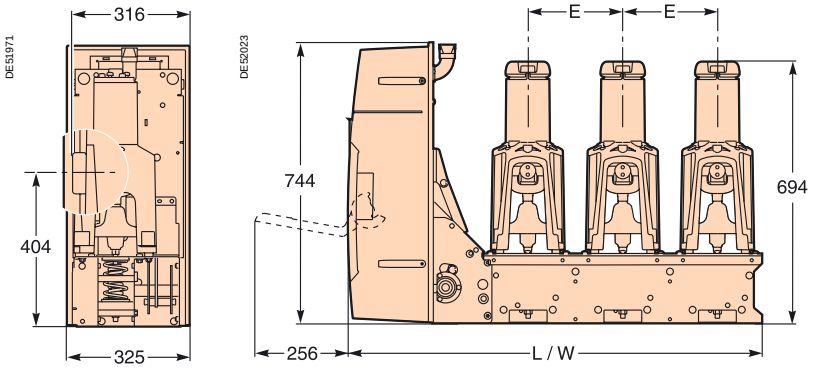
### MV connection on the right hand side

**Phase to phase distance E = 250 mm, L = 1095**

| Ur | Isc | Ir | Weight |
|---|---|---|---|
| 24 kV | 12.5 kA | 630 A | 90 kg |
| | | 1250 A | |
| | 16 kA | 630 A | |
| | | 1250 A | |
| | 20 kA | 630 A | |
| | | 1250 A | |
| | 25 kA | 630 A | |
| | | 1250 A | |

**Phase to phase distance E = 300 mm, L = 1195**

| Ur | Isc | Ir | Weight |
|---|---|---|---|
| 24 kV | 12.5 kA | 630 A | 90 kg |
| | 16 kA | 630 A | |
| | | 1250 A | |
| | 20 kA | 630 A | |
| | | 1250 A | |
| | 25 kA | 630 A | |
| | | 1250 A | |



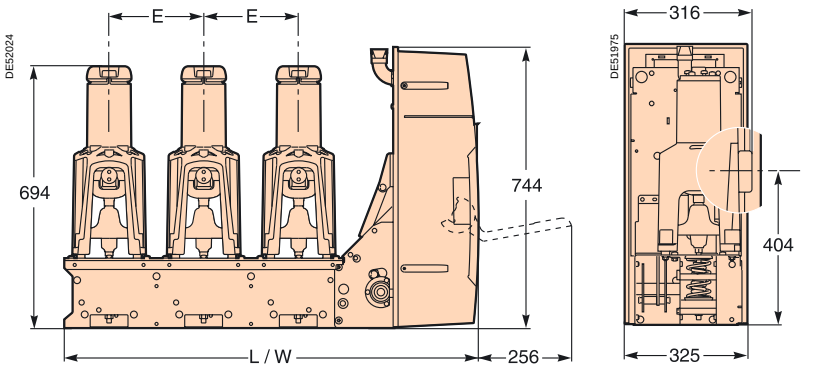

### MV connection on the left hand side

**Phase to phase distance E = 250 mm, L = 1095**

| Ur | Isc | Ir | Weight |
|---|---|---|---|
| 24 kV | 12.5 kA | 630 A | 90 kg |
| | | 1250 A | |
| | 16 kA | 630 A | |
| | | 1250 A | |
| | 20 kA | 630 A | |
| | | 1250 A | |
| | 25 kA | 630 A | |
| | | 1250 A | |

**Phase to phase distance E = 300 mm, L = 1195**

| Ur | Isc | Ir | Weight |
|---|---|---|---|
| 24 kV | 16 kA | 630 A | 90 kg |
| | 20 kA | 1250 A | |




## EVOset

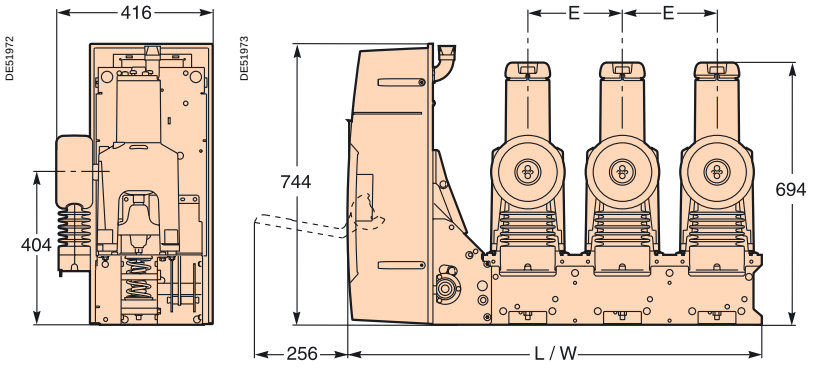
### MV connection on the right hand side

**Phase to phase distance E = 250 mm, L = 1095**

| Ur | Isc | Ir | Weight |
|---|---|---|---|
| 24 kV | 12.5 kA | 630 A | 120 kg |
| | | 1250 A | |
| | 16 kA | 630 A | |
| | | 1250 A | |
| | 20 kA | 630 A | |
| | | 1250 A | |

**Phase to phase distance E = 300 mm, L = 1195**

| Ur | Isc | Ir | Weight |
|---|---|---|---|
| 24 kV | 12.5 kA | 630 A | 120 kg |
| | 16 kA | 630 A | |
| | | 1250 A | |
| | 20 kA | 630 A | |
| | | 1250 A | |




**Important**
Detailed installation instructions are given in the “Evolis Installation Guide”. Please consult us.

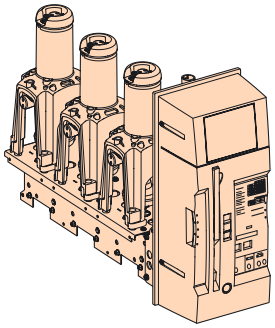
# Offer structure

**The basic fixed, lateral circuit breaker includes:**
- a manual operating mechanism (spring type)
- 1 shunt opening release YO1
- 1 block of auxiliary contacts.

**The circuit breaker can receive options.**

## Basic fixed, lateral circuit breaker

DE56118



| Phase distance (mm) | | | 250 | | 300 | |
|---|---|---|---|---|---|---|
| | | | Right | Left | Right | Left |
| **24 kV -** 125 kV peak | 12.5 kA | 630 A | ■ | ■ | ■ | |
| | | 1250 A | ■ | ■ | | |
| | 16 kA | 630 A | ■ | ■ | ■ | ■ |
| | | 1250 A | ■ | ■ | ■ | |
| | 20 kA | 630 A | ■ | ■ | ■ | |
| | | 1250 A | ■ | ■ | ■ | ■ |
| | 25 kA | 630 A | ■ | ■ | ■ | |
| | | 1250 A | ■ | ■ | ■ | |

## Circuit breaker options

**Remote control** (see possible choices in combination table below)

DE56037

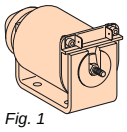


*Fig. 1*

DE56033

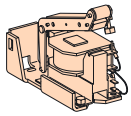


*Fig. 2*

DE56038

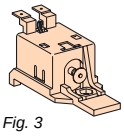


*Fig. 3*

**1st opening release**

Possibility of replacing YO1 by undervoltage release - **YM** *(fig. 2)*

**2nd opening release**

Shunt opening release - **YO2** *(fig. 1)*

Undervoltage release - **YM** *(fig. 2)*

Low energy release **Mitop** *(fig. 3)*

**Remote control including:**

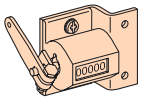
Electrical motor, gear reducer, shunt closing release, anti-pumping relay, operation counter

*Releases combinations table*

| | | | | | | |
|---|---|---|---|---|---|---|
| Shunt opening YO1 | 1 | | 1 | 1 | 1 | |
| Shunt opening YO2 | | | 1 | | | |
| Undervoltage YM | | 1 | | 1 | | 1 |
| Mitop | | | | | 1 | 1 |

## Indication

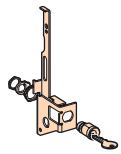
DE56040



Operation counter (already included if remote control supplied)

## Locking/Interlocking

DE56039



Open position circuit breaker locking device (without lock)

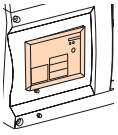
Ronis lock

Profalux lock

Push button disabling

## Monitoring device

DE56035



Pilot module (with connecting kit without LV plug)

Diagnosis by Schneider Electric expert

# Order form

Only one of the boxes (ticked [X] or filled [ ] by the needed value) have to be considered between each horizontal line.
Orange box [X] corresponds to none priced functions.

## Basic fixed, lateral circuit breaker

Quantity [ ]

| | | |
|---|---|---|
| **Rated voltage Ur** | | **(kV)** 24 |
| **Rated short-circuit breaking current Isc** | | **(kA)** [ ] |
| **Rated normal current Ir** | | **(A)** [ ] |
| **MV connection** | **On the left** [ ] | **On the right** [ ] |
| **Phase distance (mm)** | **250** [ ] | **300** [ ] |
| **Colour for push buttons and indicators** | **IEC standard** | **ANSI standard** |
| Push buttons open/closed: | red/black [ ] | |
| Indicator open/closed: | black/white [ ] | green/red [ ] |
| Operating mechanism charged/discharged: | white/yellow [ ] | charge/discharge [ ] |

## Circuit breaker options

### 1st opening release (see possible choices in combination table below)

Shunt opening release - **YO1**

| | | |
|---|---|---|
| 24 Vdc [ ] | 110 Vdc [ ] | 110 Vac (50 Hz) [ ] |
| 48 Vdc [ ] | 125-127 Vdc [ ] | 220-230 Vac (50 Hz) [ ] |
| | 220 Vdc [ ] | 120 Vac (60 Hz) [ ] |

Undervoltage release - **YM**

| | | |
|---|---|---|
| 24 Vdc [ ] | 110 Vdc [ ] | 110 Vac (50 Hz) [ ] |
| 48 Vdc [ ] | 125-127 Vdc [ ] | 220-230 Vac (50 Hz) [ ] |
| | 220 Vdc [ ] | 120 Vac (60 Hz) [ ] |

### 2nd opening release (see possible choices in combination table below)

Shunt opening release - **YO2**

| | | |
|---|---|---|
| 24 Vdc [ ] | 110 Vdc [ ] | 110 Vac (50 Hz) [ ] |
| 48 Vdc [ ] | 125-127 Vdc [ ] | 220-230 Vac (50 Hz) [ ] |
| | 220 Vdc [ ] | 120 Vac (60 Hz) [ ] |

Undervoltage release - **YM**

| | | |
|---|---|---|
| 24 Vdc [ ] | 110 Vdc [ ] | 110 Vac (50 Hz) [ ] |
| 48 Vdc [ ] | 125-127 Vdc [ ] | 220-230 Vac (50 Hz) [ ] |
| | 220 Vdc [ ] | 120 Vac (60 Hz) [ ] |

Low energy release **Mitop** [ ]

### Remote control (operation counter already included)

Electrical motor

| | |
|---|---|
| 24…32 Vdc [ ] | 100…127 Vdc/ac [ ] |
| 48…60 Vdc/ac [ ] | 220…250 Vdc/ac [ ] |

Shunt closing release - **YF**

| | | |
|---|---|---|
| 24 Vdc [ ] | 110 Vdc [ ] | 110 Vac (50 Hz) [ ] |
| 48 Vdc [ ] | 125-127 Vdc [ ] | 220-230 Vac (50 Hz) [ ] |
| | 220 Vdc [ ] | 120 Vac (60 Hz) [ ] |

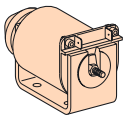
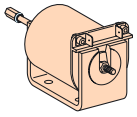
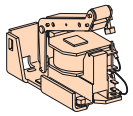
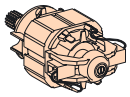
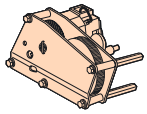
| | | |
|---|---|---|
| **Operation counter** (already included if remote control supplied) | | [ ] |
| **Open position CB locking device** (without lock) | | [ ] |
| **Lock** | Ronis [ ] | Profalux [ ] |
| **Push button disabling** | | [ ] |
| **Pilot module** (with connecting kit without LV plug) | | [ ] |
| **Diagnosis by Schneider Electric expert** (separated order) | | [ ] |

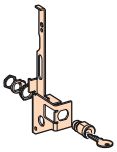
*Releases combinations table*

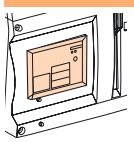
| | | | | | | |
|---|---|---|---|---|---|---|
| Shunt opening YO1 | 1 | | 1 | 1 | 1 | |
| Shunt opening YO2 | | | 1 | | | |
| Undervoltage YM | | 1 | | 1 | | 1 |
| Mitop | | | | | 1 | 1 |

# Offer structure
## Separated components

*The following components can be ordered separately and can be adapted or replaced by the customer.*

| Remote control | | | Ref. |
|---|---|---|---|
| **Shunt opening release YO1 or YO2** | | | |
| DE56037  | 24 Vdc | | **AAA10 115** |
| | 48 Vdc | | **AAA10 116** |
| | 110 Vdc | | **AAA10 117** |
| | 125-127 Vdc | | **AAA10 118** |
| | 220 Vdc | | **AAA10 119** |
| | 110 Vac | 50 Hz | **AAA10 120** |
| | 220-230 Vac | 50 Hz | **AAA10 121** |
| | 120 Vac | 60 Hz | **AAA10 122** |
| **Shunt closing release YF** | | | |
| DE56041  | 24 Vdc | | **AAA10 106** |
| | 48 Vdc | | **AAA10 107** |
| | 110 Vdc | | **AAA10 108** |
| | 125-127 Vdc | | **AAA10 109** |
| | 220 Vdc | | **AAA10 110** |
| | 110 Vac | 50 Hz | **AAA10 111** |
| | 220-230 Vac | 50 Hz | **AAA10 112** |
| | 120 Vac | 60 Hz | **AAA10 113** |
| **Undervoltage release YM** | | | |
| DE56033  | 24 Vdc | | **AAA10 124** |
| | 48 Vdc | | **AAA10 125** |
| | 110 Vdc | | **AAA10 126** |
| | 125-127 Vdc | | **AAA10 127** |
| | 220 Vdc | | **AAA10 128** |
| | 110 Vac | 50 Hz | **AAA10 129** |
| | 220-230 Vac | 50 Hz | **AAA10 130** |
| | 120 Vac | 60 Hz | **AAA10 131** |
| **Electrical motor** | | | |
| DE56042  | 24… 32 Vdc | | **AAA10 027** |
| | 48… 60 Vac/dc | | **AAA10 028** |
| | 100… 127 Vac/dc | | **AAA10 029** |
| | 220… 250 Vac/dc | | **AAA10 030** |
| DE56036  | Gear reducer | | **AAA10 065** |

| Locking, interlocking | Ref. |
|---|---|
| DE56039  | Open position circuit breaker locking device (without lock) | **AAA10 092** |
| | Ronis lock | **AAA10 058** |
| | Profalux lock | **AAA10 059** |
| | Push button disabling | **48536** |

| Monitoring device | |
|---|---|
| DE56035  | Pilot module (consult us) |

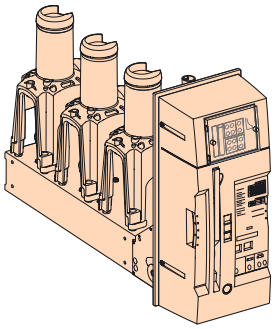
# Offer structure

**The basic fixed, lateral circuit breaker includes:**
- a manual operating mechanism (spring type)
- low energy release Mitop
- 1 block of auxiliary contacts
- phase protection relay VIP 30 and associated sensors.

**The circuit breaker can receive options.**

## Basic fixed, lateral circuit breaker

DE56119



| Phase distance (mm) | | | 250 | 300 |
|---|---|---|---|---|
| | | | Right | Right |
| **24 kV -** 125 kV peak | 12.5 kA | 630 A | ■ | ■ |
| | | 1250 A | ■ | ■ |
| | 16 kA | 630 A | ■ | ■ |
| | | 1250 A | ■ | ■ |
| | 20 kA | 630 A | ■ | ■ |
| | | 1250 A | ■ | ■ |

## Circuit breaker options

**Remote control** (see possible choices in combination table below)

DE56037

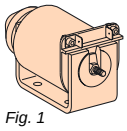


*Fig. 1*

DE56033

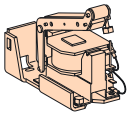


*Fig. 2*

**Protection relay**

Possibility of replacing VIP30 by:
- VIP35 (phase protection + earth)
- VIP300P (phase protection)
- VIP300LL (phase protection + earth)

VAP6 test unit for VIP relay

**Opening release**

Shunt opening release **YO1** *(fig. 1)*

Undervoltage release **YM** *(fig. 2)*

**Remote control including:**

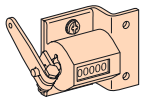
Electrical motor, gear reducer, shunt closing release, anti-pumping relay, operation counter

*Releases combinations table*

| | | | |
|---|---|---|---|
| Mitop | 1 | 1 | 1 |
| Shunt opening YO1 | | 1 | |
| Undervoltage YM | | | 1 |

## Indication

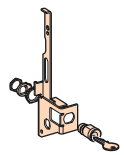
DE56040



Operation counter (already included if remote control supplied)

## Locking/Interlocking

DE56039



Open position circuit breaker locking device (without lock)

Ronis lock

Profalux lock

Push button disabling

# Order form

Only one of the boxes (ticked [X] or filled [ ] by the needed value) have to be considered between each horizontal line.
Orange box [X] corresponds to none priced functions.

## Basic fixed, lateral circuit breaker

Quantity [ ]

| | | |
|---|---|---|
| **Rated voltage Ur** | | **(kV)** 24 |
| **Rated short-circuit breaking current Isc** | | **(kA)** [ ] |
| **Rated normal current Ir** | | **(A)** [ ] |
| **Phase distance (mm)** | **250** [ ] | **300** [ ] |
| **Colour for push buttons and indicators** | **IEC standard** | **ANSI standard** |
| Push buttons open/closed: | red/black [ ] | |
| Indicator open/closed: | black/white [ ] | green/red [ ] |
| Operating mechanism charged/discharged: | white/yellow [ ] | charge/discharge [ ] |

## Circuit breaker options

### VIP protection relay

| | | | |
|---|---|---|---|
| | VIP30 [ ] | VIP35 [ ] | |
| | Service current | 8-80 A [ ] | 20-200 A [ ] |
| | VIP300P [ ] | VIP300LL [ ] | |
| | Service current | 10-50 A [ ] | 40-200 A [ ] |
| | | 63-312 A [ ] | 250-1250 A [ ] |
| VAP6 test unit for VIP relay | | | [ ] |

### Opening release (see possible choices in combination table below)

Shunt opening release - **YO1**

| | | |
|---|---|---|
| 24 Vdc [ ] | 110 Vdc [ ] | 110 Vac (50 Hz) [ ] |
| 48 Vdc [ ] | 125-127 Vdc [ ] | 220-230 Vac (50 Hz) [ ] |
| | 220 Vdc [ ] | 120 Vac (60 Hz) [ ] |

Undervoltage release - **YM**

| | | |
|---|---|---|
| 24 Vdc [ ] | 110 Vdc [ ] | 110 Vac (50 Hz) [ ] |
| 48 Vdc [ ] | 125-127 Vdc [ ] | 220-230 Vac (50 Hz) [ ] |
| | 220 Vdc [ ] | 120 Vac (60 Hz) [ ] |

### Remote control (operation counter already included)

| | | |
|---|---|---|
| Electrical motor | 24…32 Vdc [ ] | 100…127 Vdc/ac [ ] |
| | 48…60 Vdc/ac [ ] | 220…250 Vdc/ac [ ] |

Shunt closing release - **YF**

| | | |
|---|---|---|
| 24 Vdc [ ] | 110 Vdc [ ] | 110 Vac (50 Hz) [ ] |
| 48 Vdc [ ] | 125-127 Vdc [ ] | 220-230 Vac (50 Hz) [ ] |
| | 220 Vdc [ ] | 120 Vac (60 Hz) [ ] |

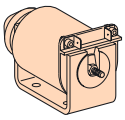
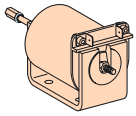
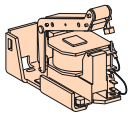
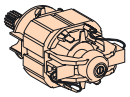
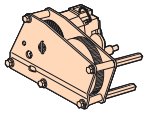
| | | |
|---|---|---|
| **Operation counter** (already included if remote control supplied) | | [ ] |
| **Open position CB locking device** (without lock) | | [ ] |
| **Lock** | Ronis [ ] | Profalux [ ] |
| **Push button disabling** | | [ ] |

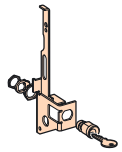
*Releases combinations table*

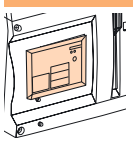
| | | | |
|---|---|---|---|
| Mitop | 1 | 1 | 1 |
| Shunt opening YO1 | | 1 | |
| Undervoltage YM | | | 1 |

# Offer structure
## Separated components

*The following components can be ordered separately and can be adapted or replaced by the customer.*

| Remote control | | | Ref. |
|---|---|---|---|
| **Shunt opening release YO1 or YO2** | | | |
| DE56037  | 24 Vdc | | **AAA10 115** |
| | 48 Vdc | | **AAA10 116** |
| | 110 Vdc | | **AAA10 117** |
| | 125-127 Vdc | | **AAA10 118** |
| | 220 Vdc | | **AAA10 119** |
| | 110 Vac | 50 Hz | **AAA10 120** |
| | 220-230 Vac | 50 Hz | **AAA10 121** |
| | 120 Vac | 60 Hz | **AAA10 122** |
| **Shunt closing release YF** | | | |
| DE56041  | 24 Vdc | | **AAA10 106** |
| | 48 Vdc | | **AAA10 107** |
| | 110 Vdc | | **AAA10 108** |
| | 125-127 Vdc | | **AAA10 109** |
| | 220 Vdc | | **AAA10 110** |
| | 110 Vac | 50 Hz | **AAA10 111** |
| | 220-230 Vac | 50 Hz | **AAA10 112** |
| | 120 Vac | 60 Hz | **AAA10 113** |
| **Undervoltage release YM** | | | |
| DE56033  | 24 Vdc | | **AAA10 124** |
| | 48 Vdc | | **AAA10 125** |
| | 110 Vdc | | **AAA10 126** |
| | 125-127 Vdc | | **AAA10 127** |
| | 220 Vdc | | **AAA10 128** |
| | 110 Vac | 50 Hz | **AAA10 129** |
| | 220-230 Vac | 50 Hz | **AAA10 130** |
| | 120 Vac | 60 Hz | **AAA10 131** |
| **Electrical motor** | | | |
| DE56042  | 24… 32 Vdc | | **AAA10 027** |
| | 48… 60 Vac/dc | | **AAA10 028** |
| | 100… 127 Vac/dc | | **AAA10 029** |
| | 220… 250 Vac/dc | | **AAA10 030** |
| DE56036  | Gear reducer | | **AAA10 065** |

| Locking, interlocking | Ref. |
|---|---|
| DE56039  | Open position circuit breaker locking device (without lock) | **AAA10 092** |
| | Ronis lock | **AAA10 058** |
| | Profalux lock | **AAA10 059** |
| | Push button disabling | **48536** |

| Monitoring device | |
|---|---|
| DE56035  | Pilot module (consult us) |

**The following components can only be adapted or replaced on site by staff trained by Schneider Electric:**

- the “Pilot” monitoring device (except on EVOset)
- remote control mechanism (comprising: electrical motor, gearing, shunt closing release, anti-pumping relay, operation counter)
- operation counter
- low energy release (Mitop)
- circuit breaker front cover.

*Panorama* *11*
*Evolis 17.5 kV fixed, frontal version* *15*
*Evolis 17.5 kV withdrawable, frontal version* *33*
*Evolis 24 kV fixed, frontal version* *53*
*Evolis 24 kV withdrawable, frontal version* *67*
*Evolis and EVOset 24 kV fixed, lateral version* *87*

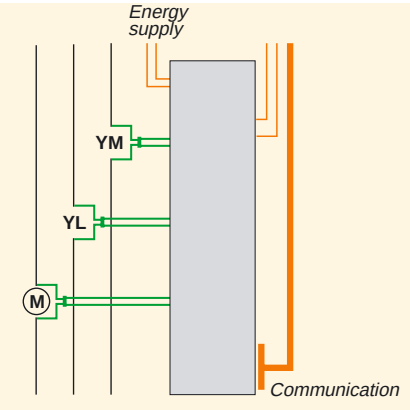
**Description of functions** **110**

# Description of functions

*Fitted on the circuit breaker, the Pilot monitors its operating conditions.*

PE55697

DE56049EN




DE56050

## The Pilot circuit breaker monitoring device has two specific features

**Monitoring operating conditions**
The device monitors external conditions and provides alarms if they are out of the specified range.

**Recording circuit breaker operating data**
Similarly to an aircraft black box the monitor device logs the circuit breaker's key data over time, allowing a diagnosis on its mechanical conditions.

## Pilot main characteristics

| Characteristics | | | |
|---|---|---|---|
| Power supply | V AC 50/60 Hz | 100/250 | –15% to +10% |
| | V DC | 24/250 | –30% to +10% |
| Service temperature | °C | | –25°C to +70°C |
| Consumption | VA or W | | < 3 |
| Measurement inputs | V AC 50/60 Hz | 100/250 | –15% to +10% |
| | V DC | 24/250 | –30% to +10% |
| Events recording capacity | | 1000 | |
| Conditions record capability | | 1000 | |
| Maintenance notes record capacity | | 256 (x 256 characters) | |

## Detailed features

**Monitoring operating conditions:**
- ■ **the module continuously monitors**
- □ opening auxiliary voltage
- □ circuit breaker ambient temperature
- □ number of operations
- □ time between operations

and sends alarms if the set points are exceeded.
- ■ **alarms are visible** on the front of the device and can also be transferred to the LV compartment, or supervision system.
- ■ **operating conditions are recorded:** minimum and maximum values of auxiliary voltage and ambient temperature are time-tagged and stored every 24 h.

**Recording circuit breaker data**
All circuit breaker events are time-tagged and stored (opening, closing, motor charging, energizing, voltage set point, temperature set point, number of operations, time between operations).

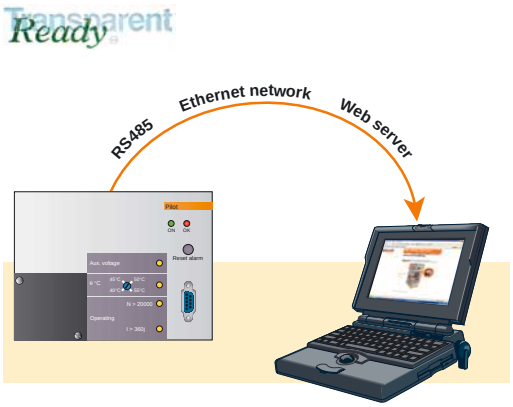
A circuit breaker expert can analyse the stored data in order to check the correct mechanical functioning of the circuit breaker, **1000 events are stored in the module.**

**Servicing note-pad**
The device incorporates this useful feature to record any information related to servicing the circuit breaker (250x250 - character note-pad).

# Description of functions (cont.)

PE60037

DE56051EN




## Local or remote data collection

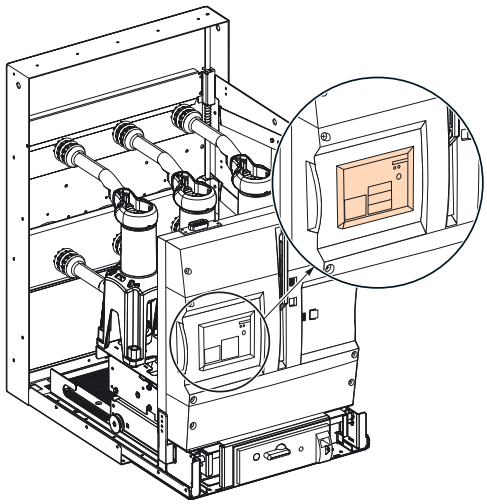
**Local use**

Alarms are displayed on the device itself.
A dry contact relay collates the faults and can be wired to the low voltage compartment.
A laptop user-machine Interface can be used to set parameters and to display and upload data.

**Remote use**

The monitoring device can be connected to a supervisor or concentrator **for connection to the Web** via a local RS485 Modbus network.
The supervisor can display, process and acknowledge alarms.
Data is then either processed in the supervision system or in the remote web-enabled system.

DE56030



## Easy to install module

The module is mounted on all Evolis 24 kV circuit breakers apart from EVOset.
It is inserted in a special slot on the front face of the circuit breaker

## This module may be added at any time during the circuit breaker's service life

The module may be factory-mounted within the circuit breaker: connection and parameter setting, are done by Schneider Electric.

The module **may be added after circuit breaker commissioning:** connection, parameter setting and testing, are done by a specialized service provider (Schneider Electric or other).
The customer is provided with the product manual and the CD-Rom containing the computerized manual and UMI PC software.

Connection to a withdrawable circuit breaker is carried out with a connection kit with a LV plug. For a fixed circuit breaker, two types of connection are possible according to whether or not the circuit breaker has a LV plug:

- a connection kit with LV plug
- a connection kit without LV plug.

## Operation and service

The "Pilot" monitoring device can be used on two levels:

- information on operating conditions
- diagnosis of mechanical circuit breaker conditions: performed by a circuit breaker expert (from Schneider Electric), by analyzing the recorded data.

**Schneider Electric Industries SAS**
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